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SPECIAL FEATURE ISSUE
Graphics . . .

The Art Studio on Spectrum

. . . soft ware starts page 11

. . . hard ware starts page 14

Wigmore House's Megamouse

Color Palette
SPREAD
EX-COPY
RANGE
SPEED
CANCEL
UNDO
OK

Deluxe Paint on the Amiga

. . . the future page 8

Amstrad's PC – more details

MORE details are beginning to emerge about Amstrad's forthcoming IBM-PC compatible, widely tipped as the next new micro from the Amstrad stable, and representing a significant move by Amstrad into the business market.

It appears that Amstrad is looking at two versions of the machine – one with at least one 5¼ inch disc unit, the second with a hard disc included. A suggested price for the first model so far is around £700, for the second, under £900. Both models are expected to be sold with a colour monitor.

Amstrad has also been working to offer substantially improved graphics capabilities than IBM's own PC machines feature. It is thought that Amstrad is closely working with a major graphic development company to produce a built-in graphic board with the machine.

Amstrad PC motherboards are currently being tested to ensure their complete software and board compatibility with the IBM standard, but Amstrad is not expected to announce the machine until the late summer.

GRAPHICS COMPETITION

Touchmaster graphics tablets – five to be won – p6

INSIDE ❯ OLIVETTI SHUNS ACORN IN EDUCATIONAL DRIVE – P4

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TRIPLE-SCROLL

Screenshots from Spectrum 48k

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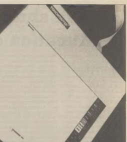
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EDITORIAL

The decline of Acorn computers from one of Britain's highly regarded manufacturers to a supplier of specialist machines to specialist markets has been sad to watch.

Sad, because the tremendous success of the BBC B in the educational sector should have been a launch pad for success in other market sectors – a compatible version for the home, for example, which the Electron never quite achieved, or a similar 16-bit model for business use, to attract all those ex-BBC school users hooked on BBC technology.

Instead it appears to have become an end in itself.

Acorn's problems in utilising the BBC's technology to sell in quality in a variety of market sectors and thus finance its research schemes culminated in the takeover by Olivetti last year. One of Acorn's major setbacks had always been its failure to attract a large export market (its foray into the US, for example, was disastrous). And exports are highly important.

More than half of Amstrad's turnover is expected to come from overseas this year and should contribute to record profits. Sinclair's success in Spain enabled it to share the cost of bringing out the 128 (both there and in the UK).

One of the strong points of the Olivetti, deal was the potential for strengthening Acorn's export performance. The opportunity is there with Olivetti's current drive into the Italian educational arena, which requires an MS-DOS machine.

Now Acorn admits that its MS-DOS compatible Master 512 is 'not ideally suitable'. The strong hint from Acorn is that it is looking for a machine that will be 'suitable'. Acorn also says that its RISC technology development will, when completed, 'solve many of these problems'.

But Acorn has stated that RISC research will take around two years to come to function.

It looks as though the opportunity has been missed.

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Popular Computing Weekly. Tel: 01-437 4343.

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Computer Trade Association Magazine of the Year

Olivetti shuns Acorn in education drive

ACORN has been dealt a blow by its parent company Olivetti, regarding the Italian firm's plans to supply the European educational computer market.

When Olivetti raised its stake in acorn to over 79%, part of the deal was that Olivetti would promote Acorn's educational machines in the European market. Now Olivetti is looking to its US partner AT&T to launch Olivetti's M19 MS-DOS micro, just two months after the launch of Acorn's Master series, which includes the MS-DOS compatible Master 512, which runs DOS Plus.

Senior Olivetti staff have been quoted as saying that Acorn's hardware base is "a real problem," although conceding that it has a "valuable software library".

"Overseas promotion is still part of the package," said an Acorn spokeswoman. "The two companies are 'married', if you like, and we are working out how to act together and best attack the market – but it doesn't happen overnight.

"In Italy the government has decreed that MS-DOS is the educational standard, which means that in the short term our products are not ideally suitable. The Master 512 is in part suitable but it doesn't go the whole way. This will not be the case in the medium term. We are looking for machines which are capable of meeting the needs of various markets."

● Hermann Hauser, co-founder of Acorn, has now been promoted to Olivetti's main board as director of advanced research and development.

BT warns against Prestel tricksters

BRITISH Telecom is warning its Prestel subscribers against confidence tricksters. The latest method being used to obtain users' security codes is deceptively simple. One person causing particular concern is telephoning customers posing as a Prestel official, and asking for passwords and identification codes. Once obtained, he can then charge his own Prestel dues to these other accounts.

BT has sent a letter to customers warning them not to release confidential information regarding passwords.

Exploding Fist tops Gallup 1985 charts

GALLUP, which compiles the weekly charts for *Popular Computing Weekly*, has announced its 'best of 1985' chart.

Top seller over all machine formats last year was *Way of the Exploding Fist* from Melbourne House. *Fist* was also the Amstrad number one in 1985. On the Spectrum and Commodore machines top slot went to the Band Aid charity tape *SoftAid*, with *Fist* second on both formats. *Elite* (Acornsoft) was the number one seller on the BBC, and *Mercenary* (Novagen) on the Atari.

This is the 1985 Top ten over all machines: 1. *Exploding Fist*; 2. *SoftAid*; 3. *Elite* (*Firebird/Acornsoft*); 4. *Ghost-busters* (Activision); 5. *Finders Keepers* (Mastertronic); 6. *Frank Bruno's Boxing* (Elite); 7. *Commando* (Elite); 8. *Formula One Simulator* (Mastertronic); 9. *Daley Thompson's Decathlon* (Ocean); 10. *Impossible Mission* (Epyx/CBS/US Gold).

Fist: last year's number one

8256 launched in America

AMSTRAD'S PCW 8256 should be available in North America through the giant retail chain, Sears, at the end of the month (see *Popular Computing Weekly*, December 26/January 2).

The deal with Sears means that each Sears store (and there is one in nearly every town in the US and Canada) will be selling the 8256 with staff trained to answer queries on the machine. It will be priced at $599 (just over £400).

Amstrad show

THE first Northern Amstrad Computer Show takes place this weekend (March 22-23), at New Century Hall, Corporation Street, Manchester. Organiser Database Publications expects over 60 new products to be launched at the exhibition.

Sinclair confirms portable will now be launched next year

FOLLOWING Sir Clive Sinclair's announcement that the Pandora Spectrum-compatible portable micro would be launched this autumn (see *Popular Computing Weekly*, February 20), the official Sinclair line is now that it will not be available until 1987.

"Some early production models may be available this year. We will be trying out these models in a number of defined market areas, but the machine will be launched in 1987," said a Sinclair spokeswoman.

One of Pandora's features still to be decided is its data storage system. Sinclair has been looking at the possibility of implementing 'credit-card' style software, possibly Smart cards, for the additional software. A certain amount of software will be built-in to the machine.

But the spokeswoman did not rule out the question of floppy disc storage, which would be more viable if Sinclair wants to attract conversions of CP/M software to the machine.

"We have been looking into the card question," the spokeswoman continued, "But there has been no firm confirmation of that."

It looks as though Sinclair is still aiming for a price for Pandora of around £399, although no exact amount has yet been fixed.

'Hackers' trial set for April 14

THE two men accused of 'hacking' into the Prestel database, Robert Schifreen and Steven Gold, are due to stand trial at Southwark Crown Court, on April 14 under the Forgery and Counterfeit Act, 1981. This comes after a number of preliminary hearings at Bow Street Magistrates Court.

First book on 8256 launched

SIGMA Press launches a book devoted to Amstrad's PCW 8256 and 8512 machines next week.

Mastering the PCW 8256/8512 was written, inevitably, using *Locoscript*, and aims to complement the machines manual, as well as clarifying parts [illegible] it.

It also devotes space to New Star's NewWord word processing program, as well as the CP/M operating system in general.

It will cost £8.95.

Details from John Wiley and Sons, Baffins Lane, Chichester (0243 784531).

Pagemaker for Master 128

AMS'S *Pagemaker*, one of a number of publishing programs now on the market, has now been made compatible with the BBC Master 128.

The package comprises a typesetter, graphics library and word processor, spread over two Rom cartridges and two discs.

In addition, this version is capable of formatting files from both *Wordwise* and *View*.

Pagemaker for the Master 128 costs £49.95. Further information from AMS at 166-170 Wilderspool Causeway, Warrington WA4 6QA (0925 413501).

RGB monitor

A NEW high resolution RGB monitor will shortly be released by Chromagraphic. Designed specifically for Spectrum 128, QL and BBC machines, the monitor will be introduced at the competitive price of £229. It does not however, contain a sound output.

Details from Chromagraphic at 135 Cliff Road, Hornsea, Humberside.

Computer LP from Mupados

DATAHITS, coupled with *SoftWhere?*, is a highly unusual computer package to be sold exclusively through WH Smith's branches and produced by Mupados.

Datahits, on side one of the tape, is effectively a computer LP, featuring, soundtracks from computer games. The themes, which include *Rambo* and *Hypersports*, have all been re-mixed in a recording studio.

SoftWhere? on side two, is rather more conventional. It is a database designed for young users.

The title should be available at WH Smith next week, priced at £4.99. Mupados can be contacted at Unit 11, Llambed Industrial Estate, Tregaron Road, Lampeter, Dyfed (0570 422877).

Anirog spans C16 and Atari ST

ANIROG is taking advantage of increased C16 sales to extend its C16 catalogue. *Winter Events*, a six-event Winter Olympics simulation, at £7.95,and *Space Pilot* (£5.95) will both be released for the machine at the end of the month.

Anirog also intends [illegible] tackle the Atari ST market this year, concentrating on entertainment programs.

Bug-Byte budget bonanza beckons

FOLLOWING the success of many companies with budget software, Bug Byte, now a publishing label within the Argus group of companies, is releasing budget productivity titles on disc.

Initially to be available for the Commodore [illegible] and 128, *Load 'n' Go* is a range of titles licensed from the US, to be sold in the UK at £7.99 each.

The series includes a word processor, *Masterword*, a desk diary, *Electronic Scheduler*, a database, *gBase*, a spreadsheet, *Personal Spreadsheet*, and two home accounts progams.

Details from Bug Byte, Liberty House, 222 Regent St, London (01-439 0666).

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Letters

Corrections

A couple of corrections to the final instalment of my wordprocessor (PCW 6-12/13).

Firstly the *Delete* function was misprinted as (CTRL)+A, it should, of course, have been (CTRL)+D.

Secondly, when converting the program to run and work on tape, *do not* delete lines 2650, 2660 and 2870.

Glenn Counsell
216a Banbury Rd
Oxford

Autorun facility

May I say that W Wako's program on Autorunning programs on the Commodore 64 was a model of ingenuity and genius compatible with your usual high standards. However, spare your blushes, there is an autorun facility provided on the Commodore 64, contrary to common knowledge, eg, *Load"PROGNAME",8:* Followed by pressing the *Shift* and *Run/Stop* keys.

Note the colon, which must be included following the device number.

You may agree that this could be a little less cumbersome than a machine code program!

W H Lovelock
Plas Llwyd Terrace
Bangor
Gwynedd

QL judgement

The juxtaposition of the letters by Paul Hardy and Ken Whyld in Vol 5 No 10 on the subject of the QL makes its own judgement. Ken Whyld, who has used the machine regularly for over 18 months, finds it a great success.

Paul Hardy, with no claim to any experience on it and no sign of any knoweldge of it, seems to wish to bury it in an unconnected slurry of computer-sales canards.

This malice seems to have been aroused by the letter in Vol 5 No 6 from LW Tomlin, again a user speaking from experience, expressing himself as so impressed by the positive qualities of the QL that he feels critical reappraisal is called for.

What Paul Hardy's farrago of inconsequential cliches of doddering parents foisting unsuitable machines on unsuspecting offspring, and of diminutive business users doggedly demanding diminutive business software has to do with the comparative merits of the QL is quite beyond me.

PRESTEL ACCOUNT NO. FRAUD

"How was I to know it was Brian Sedgemore's Prestel number I was trying to get?"

There was certainly nothing of this in LW Tomlin's letter. There has equally been nothing of it in the actual selling of the QL. It has been consistently undersold in the shops and overpanned in certain publications.

Don Quixote was thought to be a little careless of reality when he charged the windmills. But at least they were real windmills. He did not invent them for the fancied pleasure of knocking them down.

The micro drives? They are the poor man's discs. The great merit is their price. They are infinitely better than any cassette system and in some respects they outperform certain disc systems.

I do not mind Ziggurat having a reasoned dislike of the QL. I can always get my own back by reading that page last. But uninformed diatribes do annoy me as they obviously do many.

Time has come for a little pride in what is at its least an original and innovative machine.

I will stand any day at the shoulder of the Whylds and Tomlins.

Let the Hardies look to their laurels.

G C Watson
Chisholm Rd
Croydon

That's *definitely* enough correspondence on 'That Ziggurat'

Competition

TOUCHMASTER

Five Touchmaster graphics tablets to be won

If reading all about these graphic possibilities has inspired you, why not try your hand at some works of art yourself? You could win a Touchmaster graphics tablet.

The graphics tablet is a flat drawing area, equivalent to a piece of paper with an electronic stylus in place of a pen. With it you can create pictures which appear instantly on your screen. The big difference is that this pen and paper has options to use programmed circles, squares, rectangles, colour mixes and nine different types of brush stroke.

The Touchmaster graphics tablet is available for a variety of popular machines (see coupon) and special Touchware software is also available from the manufacturers. Normally, the tablet costs £49.95, but we're giving away five to the winners of our Touchmaster competition.

How to Enter

We're simply asking for an example of your own computer art – using any computer graphics program you like. That's all there is to it.

Send us your picture either as a screen dump, or on cassette or disc – it doesn't matter. Tell us what package(s) you used to create your masterpiece, and enclose the coupon with your entry.

Then post the whole lot off to Touchmaster Competition, Popular Computing Weekly, 12-13 Little Newport Street, London WC2H 7PP.

Entry Rules

Entries must reach us by Monday April 21. We cannot return entries, so if you really like your masterpiece, don't send us the only copy. Pictures submitted to the competition should not have been previously published elsewhere. The five pictures adjudged to be the best, taking the graphics aids used into account, will each win a Touchmaster Graphics tablet. Only one picture per entrant please. The judges' decision is final and all normal competition rules apply.

Popular Computing Weekly
Touchmaster Competition

Name ....

Address ....
....
....
....

Title of picture..
....

Graphics package used ....
....

Machine (tick appropriate box)

☐ **Spectrum 48K**
☐ **Dragon 32/64**
☐ **Commodore 64**
☐ **BBC B**

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Spectrum 48K	£9.95
Amstrad CPC	£9.95
Commodore 64	£9.95 tape, £12.95 disk

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New expanded 128K Spectrum version with a full mission mode, improved sound, and more ground detail. Still only £9.95!

Purnell Book Centre, Paulton, Bristol BS18 5LQ

Looking ahead

David Lawrence and Mark England assess the 'graphic revolution' which has taken place with the launch of the Atari ST and Commodore Amiga

One of the problems that always faces computer manufacturers is that when new technology comes along – say in the form of more freely available 16-bit processors – there are always two things that you can do with the increased power. Firstly you can decide to do existing things faster and better, which is what mostly happened in the early days of the home computer.

Alternatively, you can decide to do something new that previous generations of machines couldn't have handled at all. The decision is a very real one, because if you get it wrong the market will very quickly leave you behind, as Sinclair found when the QL was launched. Comparing it to a Spectrum, no-one could really see what the power of a 68000 was being used for.

This year, manufacturers are in the happy position of knowing exactly what to do in order to satisfy the public. Whatever else a new machine must be, in order to be taken seriously it must represent a giant step forward in its graphical capabilities.

The forerunner of the whole revolution was, of course Apple's Lisa and Macintosh. To Apple goes the credit for making a reality of the fashionable prediction that one day users would be able to work with a simple graphical display like a desk-top. In 1986 it is difficult to imagine anyone launching a serious personal computer that doesn't work in that way, but the window-icon-mouse-pointer side of things is only one small part of the graphics revolution.

The most important thing to realise about the latest generation of graphics machines like Atari's ST and Commodore's Amiga is that the changes aren't just cosmetic. It isn't just a matter of taking a boring 16-bit micro and adding a bit of software to draw a few pictures on the screen or to make a few mundane tasks easier to perform. The new generation are in many ways built around graphics.

When you power up an Atari ST, the graphics routines that provide the graphical display of files and menus are embedded deep in the Digital Research designed Gem operating system. Where previous generations of machines had operating systems which knew how to access the screen, disc drives, printers and keyboard, the increasing number of Gem machines also know how to draw lines, polygons, circles, how to overlay a part of the screen with a box and then remove it, how to create a simple menu or move a design smoothly around the screen, how to dump a high resolution image to the printer. Tasks which software writers in the past spent days or weeks on can now be carried out by one or two simple instructions.

Commodore's new Amiga takes the process even further than Gem, with an operating system that is capable of moving or even accelerating objects around the screen without detailed supervision from the program. Perhaps the icing on the cake is that the Amiga operating system can be supplied with a list of separate images which it will then present in a series, thus making animated sequences a simple matter.

Alongside the revolution in operating systems goes the revolution in hardware. Some of that revolution is not in the least technical. On a 64K micro, it is not surprising that few people saw much future in high resolution displays which took up more than half the available memory for a single picture. With Atari launching a one megabyte ST for less than £1000, the situation becomes a little different and the ST's 32K screen must now surely become the basic standard for future machines.

Other hardware features are not quite so familiar but they are almost all to do with solving two problems; firstly that continuous use of high resolution graphics can make big demands on the CPU chip on which the system is based, and secondly that the CPU is not necessarily the best kind of chip for carrying out some of the tasks that graphics involves – it's simply too complex.

High resolution graphics uses a lot of memory. This is no problem from the point of view of the amount of memory available in total but constantly manipulating upwards of 32K of screen memory is an enormous task. Even the current favourite CPU, the 68000 has its limits and among them must be the fast and smooth scrolling of a 32K screen. It's not that it can't be done, simply that to do it requires a high proportion of the processing power available.

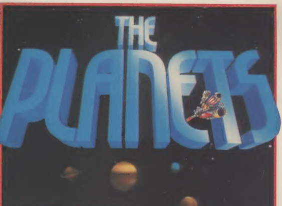
The solution is to take as much as possible of the graphics work out of the hands of the 68000 and place it into the hands of dedicated chips. Commodore showed this years ago with the 64, an unexceptional machine in Basic yet with quite outstanding graphics facilities provided by the specialist Vic chip.

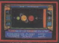
In the current generation Commodore still appear to have the edge with the Amiga's Agnus and Denise chips. Together these chips take out of the hands of the 68000 the tasks of line drawing, moving blocks of screen (or the whole screen) around, the handling of sprites, the waiting for the screen display to refresh itself and the translation of colour information in memory into a form suitable for sending to the screen. In the Amiga's case, not only are the tasks carried out faster, it also means that the main part of the system can get on with multi-tasking.

How long this edge can be maintained is anybody's guess, but it is significant that Atari, whose ST already appears to have one of the fastest screen displays around, at far less than the current price of an Amiga, have announced that buyers of the new one megabyte version of the ST will have the option of adding a "blitter" or "block image transferrer" in the near future.

All of this is good news to the consumer. Properly designed graphics-based systems are easier and faster to use than text-based machines. Properly designed programs on graphics-based machines can be given all the attractive features of the machine with very little work on the part of the programmer. Indeed, one of the quickest and best ways of assessing software on the new machines is going to be to check whether they do make use of the enormous graphics capabilities at their disposal.

Finally, and perhaps most importantly, it's good news because the reaction to the ST and the Amiga have shown that graphics is the way that buyers want to go. They have generated an enthusiasm that has been missing for a long time. Noting that enthusiasm, several other manufacturers are waiting in the wings to enter the fray. With Atari launching a 512K television-based ST for less than £400, the battle to bring the graphics revolution into the mass market is about to begin.

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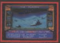
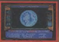
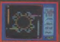

VIEW FROM WINDOW OF THE SURFACE OF PLUTO


IN ORBIT AROUND EARTH — WILL IT SURVIVE?


AN ALIEN GAME — BUT WHAT DOES IT MEAN?

The Year is 2007. Life on planet Earth is coming to an end. A series of monumental natural disasters has thrown the Earth's climate into a deadly spiral — a second Ice Age has already begun. The skies are black with volcanic dust. Massive earthquakes hamper the world's futile attempts to cope with the changing environment. All seems doomed. Into this darkening chaos an Alien life force makes its presence known. A metal capsule plummets unscathed through the atmosphere. It contains a map of the Solar System and shows the position of eight other capsules, one for each of the Earth's planetary neighbours, Mercury, Venus, Mars, Jupiter, Saturn, Neptune, Uranus and Pluto.

A radio signal is received from deep space. When decoded it is found to be a computer program. The program is loaded into a suitable microcomputer. A strange game unfolds which appears to obey certain complex rules — but there are no instructions or explanations. It is obviously of great significance, but what does it mean?

A spacecraft is prepared in a desperate attempt to reach the other eight capsules. You are selected as its pilot. The hopes of the world go with you.

This outstanding program is much more than a game. Using stunning state of the art graphics and the latest programming techniques, the Solar System in all its power and mystery will unfold before your eyes. Heather Couper, President of the British Astronomical Association has been fully involved in its computerised creation to make sure that everything is as accurate and up-to-date as possible. Even the results of Voyager II's recent encounter with Uranus have been incorporated into the creation of that cold and inhospitable world.

And yet it is a game, and a very challenging one at that. The Solar System, the strange alien game, the eight mysterious capsules are all interconnected. Together they hold the key to survival of life on Earth.

For those able to reach all eight capsules and make sense of all that they find — there are prizes to be claimed, but for all who attempt this exciting quest, the journey itself will prove more than worthwhile.

THE PROGRAM USES OVER 125K OF MEMORY.

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THE WRITER

"The Best"

When it came to reviewing the best in wordprocessors for the Spectrum, Your Sinclair (Jan. 1986) said "I have no doubt that 'The Writer' will take over as the best Speccy wordprocessor."

Praise indeed. But praise we think is warranted for what one industry pundit described as "Probably the best wordprocessor I've seen for any Z80 based micro."

Just look at these professional features: up to 127 column screen display; Wordstar* compatible; Tasword II compatible; true printer spooling; user definable printer definition files (works with virtually any printer which can be interfaced to a Spectrum); pull-down menus; extensive 'help' files on non-tape versions; mail-merge (works with 'The Database' – forthcoming); print-merge: enables the definition of variables and numeric expressions in text; 48K and 128K Spectrum versions; Mouse/Joystick pointer options coming.

'The Writer' – "Simply, the best wordprocessor for the Sinclair Spectrum."

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SofTechnics, 12/13 Henrietta
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Tel: 01-240 1422/7877. Tlx892379.
Write for details of "The Database"
and "The Spreadsheet"
coming soon.
(The Writer and Artist II are
available on most formats — disk,
Microdrive and tape).

*Wordstar is a registered trademark of MicroPro.

THE ARTIST II

"Better than the Best"

When we launched 'The Artist' in 1985 it was reviewed as the most amazing graphics package to have appeared for the Spectrum. Indeed, it became one of those very few 'utilities' to actually get into the Gallup Chart…

But now a new graphics package is all set to knock 'The Artist' off its Number One spot – 'The Artist II.'

Artist II has been designed to be the 'best-bar-none' with features including: Icons and Pull-Down Windows; Mouse Control Options (works with four different kinds of mice); 48K and 128K Spectrum versions; same unbeaten line up of graphics features – but now with the addition of elastic-lines, elastic-circles, elastic-elipses and elastic boxes. Artist II now supports a full range of printers and enables 'dumps' in a variety of sizes. And yes, like Artist I, Artist II is still the only graphics package of its kind with a fully flexible 'cut & paste' facility for any shape of graphics.

PAGE-MAKE-UP: Artist II will also allow 'The Writer' files to be merged in and enable you to do true 'page make-up' as on much more expensive micros. Ideal for club/school magazines, broad sheets, etc. etc.

'The Artist II' – "It's bettered the best."

The missing link

As part of this month's Graphics feature we look at the hardware. Devices that form the link between your hand and the computer screen – which most closely matches your hand movements to plotting on screen?

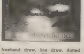
Sophisticated

Program *MS-2000* **Micro** Commodore 64 (also MSX) **Price** £69.90 **Supplier** Wigmore House, 32 Savile Row, London W1X 1AG

If you want the best in graphic packages, you should invest in a mouse - specifically, the Wigmore House MS-2000, which certainly outperforms any of its rivals. We've looked at this product before, but, to recap, the MS-2000 is an excellent piece of hardware, based on the familiar mouse principles of a rolling ball beneath the unit to register movement, and two sensitive switches on the top. The software is also very sophisticated, and is entirely controlled by icons.

The graphics software, *Cheese*, is available on tape or disc, and a Rom version is planned. The command icons appear on the bottom of the screen, and to select your option you merely move the arrow over it.

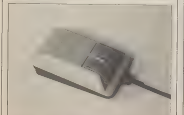
All the usual options are there: freehand draw, line draw, dotted line, box, circle, fill, copy, delete, circle, solid circle, pencil thickness, "spray", zoom, mirror, flip left/right, and printer output.



What is unusual is that all the drawing is practically instant, the fills very quick, and the "tile" effects in which you can paint whole areas in a pattern selected from choices are amazing.

The MS-2000 is a hefty £69.90, but worth every penny. It has its disadvantages; for instance, you cannot transfer tape files to disc if you update, and there is no text entry option. However, forthcoming software releases will include much more sophisticated packages, and the *Cheese* package provided with the mouse is very good to be getting on with.

Chris Jenkins



Flexible

Hardware *Megamouse* plus software: *Cadmouse, The Artist* **Price** £67.85, *Cadmouse* £29.90, *The Artist* £56.35 **Micro** BBC B (conversion to Commodore 64 planned) **Supplier** Wigmore House, 32 Savile Row, London W1X

Wigmore House's modestly named *Megamouse* is a sturdy looking device, and surprisingly heavy. The rotating ball is coated with rubber to enable you to use it more easily on a smooth desktop, and it has three control buttons at the front, allowing for flexibility. With a resolution of 100 points to the inch, it is compatible with AMX's mouse, so if you already have AMX's device, you can still use Wigmore's software.

Software so far designed for use with the *Megamouse* comprises *Cadmouse* and *The Artist* (which is *not* Softechnics' package but a different program).

Cadmouse is entirely icon driven – the icon set appears along the bottom and down the right hand side of the screen. As its name suggests, it is a design aid, rather than a picture creator.

Cadmouse offers a bewilderingly large set of options: it will work either in Mode 0 (two colours, hi-res) or Mode 1 (four colours, medium res), lines, fills, rectangles, circles, ellipses, polygons, rubber banding, cross-hatching, airbrush, continuous x,y coordinate update, drag facility, duplication ad infinitum, instant dimension lines, arcs to exact degrees, change speed of mouse mirror images; in fact, everything, *and* you can design the kitchen sink. To be taken seriously.

The Artist, which runs in Mode 2, uses two separate screens for menus, which you must click to from the drawing area to select options. Again, it's very flexible, and has the added perk of an animation option. All the usual drawing options (fill, airbrush, etc) are here, plus some extras. A zoom mode is available, so that you can enlarge tiny areas of the screen to get the drawing exactly right.

It will take in digitised pictures and alter them, and you can design your own brush – choose red and white stripes and draw long lines of toothpaste, for example. The only quibble is the fairly hefty price tag of £56.

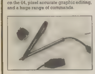
Wigmore also supplies a separate utilities pack for both programs at £15 which allows you to do colour screen dumps.

Christina Erskine

Worthy buy

Program *Trojan Cadmaster* **Micro** Commodore 64 **Price** £19.95 **Supplier** Trojan, 166 Derlwyn, Dunvant, Swansea SA2 7PF

Trojan produces a number of lightpens, including models for the Dragon and BBC. *Cadmaster* is the Commodore 64 version, and a worthy buy, offering use of all 16 colours on the 64, pixel accurate graphic editing, and a huge range of commands.



Particularly interesting are the Quill options which give lines thicker along one axis than along the other.

At £19.95 the *Cadmaster* is not as advanced as the Microscribe, but offers more graphics options.

Chris Jenkins

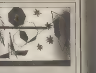
Option range

Hardware *Amicron Microscribe Lightpen* **Micro** Commodre 64 **Price** £29.95 **Supplier** Amicron, 62-64 Queen's Road, Reading, Berks, RG1 4BF

For ambitious graphic artists who want more than software packages, it may be worth investing in some specialised hardware, such as a lightpen. Up until recently most lightpens were unreliable and poorly supported by software. Now there are several on the market which come with excellent graphics software, and are engineered to much higher standards.

All lightpens work by roughly the same method. By checking the position of the cursor against the screen scan timing, the software can react to the position of the lightpen on the screen to alter the graphics displayed. It's a fast and easy way of controlling graphics.

The Amicron Microscribe lightpen is a sophisticated piece of technology, which dispenses with the necessity for using any keyboard controls by having a sensor built into its tip. The barrel is of stainless steel and there is a long flexible lead.



The lightpen plugs into the 64's joystick port. The software, provided on cassette with an option to dump to disc, interacts very well with the hardware, to the extent that the cursor will react to lightpen movements even when the pen is three to four inches from the screen.

The graphics software *Graffiti* (there are two other programs with the package, a graphic calculator and a programming utility) offers a good range of options, selected from a series of menus using the pen.

At £29.95 it's worth considering if you dislike the slowness of a joystick-driven system.

Chris Jenkins

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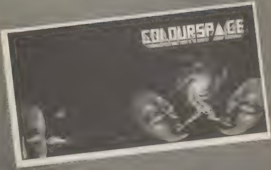
COLOURSPACE

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The Pixel Palette

For our special feature this month, we are looking at graphics on your micro. Here we review some of the most interesting software packages, looking not so much at those that would be useful for artists as those that make artists of us all . . .

The idea of what a graphics package is has changed recently. It's a change as much to do with intentions as it is to do with technology.

Even a couple of years ago all that was expected of a graphics program was that it should give the artist features and flexibility that were as close as possible to those of paint and paper, with some instant geometric shapes and a few time saving elements thrown in. The presumption was that the skills necessary to create pleasing results were acquired elsewhere. The programs were tools for artists more than tools to make people into artists.

Recently that view has changed. Some of the programs mentioned here have features so powerful that familiarity with the system and imagination have become considerably more important than the computerised equivalent of conventional drawing skills. Get a shape right once and you need never get [illegible] right again – use powerful commands to take that shape and repeat it endlessly on your screen. Getting precise details right is made much simpler by options to magnify the screen and work pixel by pixel . . . and so on.

Colourspace, though conceptually different from the other programs here, with different intentions, exemplifies some of the changes outlined above. It produces astounding and changing graphic visions, using principles of sequencing more like those found in electronic music . . .

Drawing mode

Program *Degas* **Micro** ST **Price** £39.95 **Supplier** Antiolasoft, 68 Long Acre, London WC2.

Degas is one of the first graphics packages for the ST, apart from those supplied with the machine. It is quite astonishingly easy to use, but fairly powerful. The mouse helps, of course, the cursor used both for menu selections and the actual drawing on screen.

Degas uses a straightforward command format – options are simply listed in a series of menus and boxes representing choices. Combinations of choices are highlighted. It doesn't look particularly elegant, but proves considerably more helpful than a series of dodgy icons.

There are 15 brush styles available with a choice of drawing modes, depending on whether your current task is freehand sketching or precision plotting of individual points. As a feature distinct from the brush style, there is a choice involving the actual kind of line drawn, eg, continuous, dashes, dots and dashes.

Shapes can be filled with texture derived from a choice either of 38 preset patterns or from patterns you have customised yourself using a grid representing each individual pixel. Again the mouse cursor is used to switch on and off the individual pixels.

More advanced features include copying blocks of screen from one location to another; particularly impressive is X-Ray Copy which takes your defined block and superimposes it on top of the existing background without rubbing existing designs out. Another excellent feature with a wide number of possible parameters is Shadow which allows you to generate a 'shadow' of your drawing at a specified distance and direction.

Text and Font features form a significantly larger part of *Degas* than most other graphics programs. It is possible not only to design your own Font styles, but to use those styles in various permutations of height and width within *Degas*. All features associated with drawings can be used with text including X-ray superimposition and shadow.

The manual explains the features of *Degas* very clearly and includes some useful technical information on printing out your pictures, should your printer be significantly different from those already provided for on the *Degas* disc. Easy to use and powerful too. What more could you want?

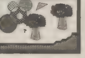
Graham Taylor

Detailed

Program *Art Studio* **Price** £14.95 **Micro** Spectrum **Supplier** Rainbird, Upper St Martins Lane, London WC2.

A graphics program so good it not only has every feature professional artists could possibly want, it even does its best to rewrite the dreaded Spectrum hardware.

Art Studio has a feature which will ensure that your designs and drawings do not overlap an attribute square. It means that, although you can position everything exactly where you want, you can ensure that colours will always fill properly without any unexpected staircase edges of the wrong colour.



The icons used with *Art Studio* actually appear to help rather than hinder finding and selecting the right commands – not always the case.

The drawing pen is definable from a single pixel for highly detailed work to a spray of pixels for an airgun effect. Like *Degas*, there are extensive provisions for incorporating your own fonts in the program.

Conventional features like circles, ellipses, squares and rectangles are mixed with sophisticated options like 'magnify' – [illegible] examine a section of screen in great detail – and block options to take an area of screen, manipulate it both in size and position and replace wherever you wish on the screen.

The program can be customised to work either via the keyboard or using mouse or joystick. The version of *Art Studio* for the 128 makes use of the greater memory [illegible] the machine for picture storage, but is not significantly different in any other way. Versions for Commodore and Amstrad are in preparation. A marvellous program.

Graham Taylor

Pedigree

Program *Melbourne Draw* **Micro** Amstrad **Price** £14.95 **Supplier** Melbourne House, 60 High Street, Hampton Wick, Surrey GT1 4DB.

Though there are undoubtedly more sophisticated packages, the Spectrum version of *Melbourne Draw* is probably still used by more programmers for games graphic design than any other package. The reason for its success seems to be due not so much in its range of functions as having the right functions – it is possible to achieve just about any effect using one combination or another.

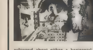
Melbourne Draw has now been converted to the Amstrad, where end results are potentially far more impressive than on the 'you can't put that colour 'ere mate' colour attribute problem-ridden Spectrum.

Commands in *Melbourne Draw* are rather like those in *Locoscript* and other business software. To begin with, selections are made via a series of drop down menus.

Once you become familiar with the program almost all of these options can be accessed by simple one or two letter commands.

The real strength of the program resides in the way you need only do anything once. For example, if you design a complex shape (referred to by the program as a 'texture') you can get the program to remember it and then use and re-use that texture in any part of the screen.

You can even 'paint' with it, creating complex multi-layered effects. Sections of the screen may be similarly defined as blocks and mirror effects may be achieved about either a horizontal or vertical axis.



There are paint spray effects, a choice of cursors, you can include text in your picture and it has the ability to save not only pictures, but textures as well. The tape includes three Basic programs for loading completed pictures into your own programs (one for each screen res) and an extremely helpful manual.

For final proof of just what this program will do on the Amstrad, take a look at some of the demo pictures provided with the program.

Graham Taylor

The inner light

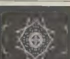
Package *Colourspace* **Micro** Atari 520 ST **Price** £19.95 **Supplier** Llamasoft, 49 Mount Pleasant, Tadley, Hants.

Colourspace was originally developed as *Psychedelia* on the Commodore 64, but the 520ST version is superior even to the versions of *Colourspace* on the eight bit Ataris.

This is a live interaction "light synthesiser", creating moving patterns under the control of a joystick (on the 520, the mouse). A cursor dot can be switched on or off and there are seven symmetry modes, four "local lightforms" creating patterns close to the cursor position, four "global light forms" for the whole screen, "explosion" and "implosion" modes, horizontal and vertical expansion, etc.

Streaming lines of blocks, squares, circles and so on can be created, as can more three-dimensional rotating patterns. The 520 *Colourspace* is compatible with *Neochrome*, the graphics package bundled with the ST, so it's possible to load in still pictures and create moving patterns over them.

If you're prepared to accept slightly slower plotting, it's possible to use a Starfield background with various types of symmetry, which gives effects like the final scenes of *2001*. Colour and colour rotation, symmetry and complexity of the patterns can be varied "live".



Although it can be sequenced, *Colourspace* is basically a live performance "light instrument", a comparison with the opening credits of *Dr Who* being only a starting point. Inspired by "Pink Floyd, Genesis, The Laserium, Marillion, Rush and many more", *Colourspace* can truly be described as the 80s equivalent of the glass kaleidoscope, only better. It really has to be seen to be believed, and should be a compulsory purchase for anyone interested in exploring the graphics abilities of the ST.

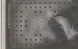
Chris Jenkins

Textured

Program *QL Paint* **Micro** QL **Price** £24.95 **Supplier** Sinclair Research, Milton Hall, Cambridge CB4 4BE

Not a lot of people know this, but Talent is the company responsible for the Amstrad version of *Melbourne Draw* featured also on this page. Sinclair's *QL Paint* program was also written by Talent and is very similar to its Amstrad counterpart.

QL Paint uses the same mixture of commands and drop down menus, although icons are used to represent the main menu options. I'm becoming less and less convinced by icons – the 'picture worth a thousand words' principle only works where the meaning of the picture is abundantly clear.



The features of the QL program are almost exactly the same as those on the Amstrad Draw. Basic drawing is via a variety of brush styles including an airbrush effect which gives a slightly haphazard spray area.

Block commands allow you to isolate a section of your screen, save it, and use that defined section at will on the screen. Having drawn one house, for example, you could use a block command to create a row of them. Blocks can also be manipulated by 'mirror' commands.

The texture command allows you to create an area of your own design which can then be used as the 'paint' for the brush. For example, you could design a simple pattern to represent tufts of grass and then 'paint' an entire field of them.

A nice touch with the package is a short section written by a computer artist, not so much on how to use the program, but how to get the graphical effects you imagine.

Graham Taylor

Simple

Program *Paintbox* **Price** £7.95 **Micro** Commodore 64 **Supplier** Audiogenic, 12 Chiltern Enterprise Centre, Station Road, Theale, Berks.

One of the best specified home computers for graphics use is the Commodore 64, with its 16 colours and wide range of graphics modes. It's no surprise then that there is a good deal of powerful graphics software designed for the machine.

Many of the best-known packages, such as Quicksilva's *Doodle* and the *Koala Pad* and software distributed by Audiogenic, have been available for some time and have been reviewed. There are, however, still good packages coming out, with a wide range of features and varying price targets.

Of the more recent releases, one of the best inexpensive packages is Audiogenic's *Paintbox* cassette at £7.95. Backed with a version for the C16-Plus/4, *Paintbox* is straightforward to use. Overcoming the perennial problem or having to flip from a menu display to the drawing display by using a "duckshoot" of options beneath the screen, Paintbox has a familiar range of drawing options: draw, lines, rays, box, circle, colour, brush shape (a choice of eight), fill, copy, delete, and so on. The 64 version has two separate drawing areas.

Pictures can be saved or loaded to tape or disc, and control is by keyboard or joystick. *Paintbox* is certainly a good beginners' package.

Chris Jenkins

Fine Art

Program *The Artist* **Micro** Spectrum **Price** £9.95 **Supplier** Softechnics, 12/13 Henrietta Street, Covent Garden, London WC2E 8LH.

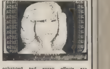
The Artist is another graphics program for the Spectrum. In features it closely rivals the *Art Stuio* and for some people can be considered an equally valid choice.

There are facilities to cut and paste sections of drawing, to enlarge the local area being worked on for line detail work, as well as a choice of brush sizes and paint textures.

The Artist also includes extensive UDG handling facilities so that both text font and fill patterns can be totally redesigned.

The Artist uses a system not found in most other graphics packages to define line positions. The screen actually contains two cursors, one is the conventional one controlled by keyboard of joystick, the other is a 'reference' cursor which mimics the movements of the main cursor at a given distance. Lines can be drawn from reference to main cursor or, in other modes, the two cursors can be used in tandem for parallel effects.

It's worth mentioning that the version of *The Artist* currently available is shortly to be superseded by *Artist II*. Although unseen at present this is claimed to have built in routines for connections to a wide range of printers, lightpens and mice. The cut and paste facilities are



enhanced and spray effects are included.

Price for *The Writer II* will be £14.95 and it is intended to be compatible with most makes of mouse, as well as the more common joysticks.

Graham Taylor

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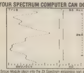

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Communications

Terms and jargon

Firstly, this week, thank you to everyone who has written to me with queries and ideas for the column. I'm still ploughing through all the correspondence, but I'll devote a Communications page soon to answering them.

In this issue, however, in response to a number of pleas, I'm going to start a glossary of terms and jargon (and there's plenty of it) associated with networking.

Some of the terms may seem very basic, like, for example, the word modem itself, but bear with me.

Ascii
The industry standard series of codes which represent different characters, eg, A has the ASCII value of 65. When modems talk to each other it is Ascii codes which are sent. Ascii stands for American Standard Code for Information Interchange.

AtAscii
A variation of the standard Ascii used by Ataris; it stands for Atari Ascii.

Baud
The measure of speed of data transmission in bits per second.

BB/B-B/
These are abbreviations for Bulletin Board

Bulletin Board
This is a free service similar to Prestel/Micronet. BBs have many features including telesoftware and E-Mail.

Carrier Tone
This is the name of a tone which is given if a modem is on-line.

CCITT
The name of a body of people who have established world wide standards in speeds and other areas of communicating. America is about the only country not to comply to these standards.

CommuniTel
The name of the software on which the ITeC boards and some others run. It is colour and Prestel compatible.

Dumb Terminal
This is the name given to a terminal on a network which has no computing ability. It is purely for transmitting and receiving of data. It has no 'intelligence', hence it is dumb.

Duplex
This describes whether communication is one or two directions at one time. *Full Duplex* – communications in two directions and data is sent in both directions at the same time. *Half Duplex* – communications in two directions but data is only sent in one direction at one time (sometimes called Simplex).

Echo
Echoing is printing of transmitted/received data to the screen or printer. *Local Echo* - This means that the data transmitted by you is 'echoed' or printed on your screen.

Electronic Mail (E-Mail)
This is a system which enables a person (or company) to have a 'mailbox' on a bulletin board. People can leave messages to the owner of a mailbox, and the owner (and nobody else) can see these messages or mail hence the name electronic mail.

Information Provider
This is a person or organisation who provides information for BBs. The largest and best known IP is Micronet 800, which is an information provider for the Prestel BB. Homelink is another large IP on Prestel. IPs are not only for Prestel but for many of the other 'free' public BBs.

Intelligent Terminal
Simply the name given to a terminal on a network, which has computing power internally and doesn't have to use another computer to perform all of the calculations etc., which it has to perform. Your computer with its modem is an intelligent terminal. This is the opposite to a dumb terminal.

Modem
Stands for MODulator DEModulator. It converts signals from the computer to tones which may be transmitted over the phone lines and then converted back again.

Micronet 800
The information provider on Prestel which provides all of the information associated with computers and home computing. Micronet is Prestel's largest database with almost 20,000 subscribers. It is about to launch a 'Sunday Supplement' type magazine area, which will deal with many subjects not directly connected with computing.

MUD
Stands for Multi User Dungeon. It is a multi-user adventure which was begun at Essex University and is now available on computer and also from British Telecom. Many people with modems may log-on to a MUD game at the same time, and as they play they can meet each other, have fights, battles, conversations or even make friends. MUD is tremendous fun and I'll report on it soon.

Multiplexer
This is a device which combines data from many terminals into a single stream of data which may be sent over the phone lines. At the other end, another multiplexer can convert this single stream of data back to many individual sets of data, the same as were sent.

NBBS
The name of a piece of software on which some BBs are run, on the BBC B.

Parallel
i) Refers to an interface used for parallel data transmission. The Centronics interface is the most common example on the market.
ii) An expensive method of transmitting data, it envolves sending the whole binary Ascii value of a character at the same time. Parallel transmitting is used a lot for sending data to a printer.

PSS
Packet Switching System. PSS enables you to call all over the world at the cost of a local phone call! You could phone Australia for the same charge as your next door neighbour. An initial charge, as well as quarterly fees do make PSS expensive to the average user. More on PSS in future columns.

Prestel
The name of the largest BB in Britain. It is run by BT.

Protocol
The *data protocol* is the number of bits, stop bits and whether or not the parity of the data is even, an example is 7 data bits, 1 stop bit and odd parity.

Rx
Abbreviation for Receive

More glossary and terms next week; in the meantime here's this week's BB Top 10:

Name	Baud rate	Number
1 Blueline	300/300	0843-32637
2. CCCBB	300/300 Ring Back	0243-817077
3 Metrotel	1200/75	01-941-4285
4. MicroGnome	1200/75	01-668-8894
5. Maxtel	300/300 & 1200/75	01-346-7150
6. TBBS – London	300/300	01-348-9400
7 Communitel demo 1	1200/75	01-968-7402
8 Dark Crystal	300/300 & 1200/75	01-954-3847
9. Falcon Board	300/300 & 1200/75	0268-46681
10. CBBS – SW	300/300 & 1200/75	0392-53116

Three new BBs for you this week: the first one's ABBS in London. It's 300/300 baud, 24 hours and number is 01-373 6337. Secondly there's the COCO BB, that's COCO as in COlour COmputer. It too is 300/300 baud and is in Tyneside, the number's 091-265 1944 and it's 24 hours a day.

Lastly there's OSI, this too is 300/300 baud but it's also a ring back board. I don't know the hours but the number is 01-429 3047 and so it's obviously in London.

David Wallin

If you have any queries, tips or comments to make about any aspect of micro communications, David Wallin would love to hear from you.

Write to him at *Popular Computing Weekly* 12-13 Little Newport Street, London WC2H 7PP.

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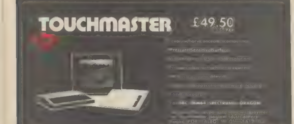

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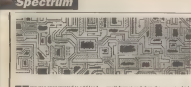

SCREEN AID

by R A Houlton

Have you ever wanted to add loading screens to your programs like those you find in commercial programs? Or would you like your printer to produce notices, tickets, invitations, etc? This program will give you an attractive style of lettering, both upper and lower case, together with punctuation marks and other symbols from the Spectrum keyboard. The letters can be in large or small format and both are larger than the normal Spectrum lettering. Proportional spacing is also used and letters such as "g" and "y" have true descenders.

On running the program you will be given a screen of information and will then be asked to set the default values of the attributes *Paper, Ink, Bright* and *Flash*. On any break in the program the computer will return to these values. Next you will be asked to set the attributes for the first line of printing. Your next choice is between the large or small format and then the row at which the print is to be placed. There are 14 print rows numbered 0 to 13. Large letters occupy two print rows, compressed letters one row.

It is possible to print on any of the rows,but if you are using the large letters beware of overprinting. The program will accept fractional entries such as '2.25' which can be useful when placing print in relation to other graphics. Since the program uses the *Plot* facility, this leaves the User Defined Graphics free for your own use.

Because the print lines used by the program do not follow the normal Spectrum print positions, the screen memory is Poked with the current attributes over the area to be covered by the print. After the line has been printed, you are given the option of changing the attributes for the next line but be careful when using this option that the new attributes do not overwrite previous ones.

The final option between each line of print is the facility to print *More*, to *Save* the screen to tape, to *Erase* the line just printed, to *Copy* the screen to a printer, to *Reset* the program to the start or to *Quit* the program. These options are obtained by pressing the initial letter of the option required.

The *Erase* option removes the printing but leaves the attributes in place. The *Copy* option will ask for the number of copies required and after printing them will then return you to the final option. The *Reset* option clears the screen and takes you to the start of the program.

Each large character is 25 pixels high and the compressed ones are 13 pixels high. The width in both cases varies between five and 21 pixels. There is a four pixel gap between letters and a space is eight pixels wide.

If only capitals are required then only enter values of A$ from A$(1) to A$(18) and *Data* lines 9000 to 9250.

```
 730 IF Q=1 THEN GO TO 770
 740 IF Q=2 THEN INPUT "PLOT POSITION N
OT [illegible] ";(256-F);" ";B
 750 IF B+F>255 THEN GO TO 740
 760 LET B=B: GO TO 780
 770 LET B=INT ((256-F)/2): LET H=R
 771 LET HOR=22528+(32*(21-INT (D/8)))+I
NT (B/8)
 772 IF H=1 THEN LET DEPTH=3
 773 IF H=2 THEN LET DEPTH=5
 774 FOR J=1 TO DEPTH
 775 IF HOR<22528 THEN GO TO 777
 776 FOR I=HOR TO HOR+INT (F/8+[illegible]): PO
KE I,[illegible]: NEXT I
 777 LET HOR=HOR-32
 778 NEXT J
 780 IF L=3 THEN LET B=R
 790 FOR I=1 TO LEN E$
 800 LET X=B: LET Y=D
 810 RESTORE 9000+(CODE E$(I TO I)-65)*1
0
 820 READ C
 830 FOR J=1 TO 13
 840 READ W
 850 FOR K=1 TO LEN A$(W)
 860 IF A$(W)(K TO K)="0" THEN LET X=X+
2: GO TO 890
 870 IF L=1 THEN PLOT PAPER P; INK N;
BRIGHT M; FLASH S;X,Y: LET X=X+2
 880 IF L=3 THEN PLOT OVER 1;X,Y: LET
X=X+2
 890 NEXT K
 900 LET X=B: LET Y=Y+H
 910 NEXT J
 920 LET Y=D: LET B=B+C
 930 NEXT I
 940 INPUT "CHANGE ATTRIBUTES? (Y/N)"; L
INE C$
 950 IF C$="Y" OR C$="y" THEN GO SUB 10
50
 960 INPUT ("MORE,SAVE,ERASE,COPY,RESET,
QUIT?");Z$
 970 IF Z$(1)="M" OR Z$(1)="m" THEN LET
L=1: GO TO 520
 975 IF Z$(1)="S" OR Z$(1)="s" THEN LET
L=2: GO TO 1020
 980 IF Z$(1)="E" OR Z$(1)="e" THEN LET
L=3: GO TO 780
 985 IF Z$(1)="C" OR Z$(1)="c" THEN INP
UT "HOW MANY COPIES? ";Z: FOR I=1 TO Z:
COPY : NEXT I: GO TO 960
 990 IF Z$(1)="R" OR Z$(1)="r" THEN GO
TO 450
 995 IF Z$(1)="Q" OR Z$(1)="q" THEN STO
P
```

```
1010 GO TO 960
1020 INPUT "FILENAME ? ";F$
1030 SAVE F$SCREEN$
1040 GO TO 960
1050 INPUT "PAPER COLOUR? (0 TO 7)";P
1060 IF P<0 OR P>7 THEN GO TO 1050
1070 INPUT "INK COLOUR? (0 TO 7)";N
1080 IF N<0 OR N>7 THEN GO TO 1070
1090 INPUT "BRIGHT? (0 OR 1)";M
1100 IF M<0 OR M>1 THEN GO TO 1090
1110 INPUT "FLASH? (0 OR 1)";S
1120 IF S<0 OR S>1 THEN GO TO 1110
1130 RETURN
8600 REM NOTE THAT THE NUMBERING OF
THE FOLLOWING DATA LINES MUST BE PRE
SERVED
8970 DATA [illegible]: REM SPACE
8980 DATA [illegible]: R
EM !
9000 DATA [illegible]
6: REM A
9010 DATA [illegible]
[illegible]: REM B
9020 DATA [illegible]: REM C
9050 DATA [illegible]
[illegible]: REM D
  10 REM          SCREENAID
  15 REM R.A.HOULTON
  20 DIM A$(41,21)
  30 LET A$(1)="[illegible]"
  40 LET A$(2)="[illegible]"
  50 LET A$(3)="[illegible]"
  60 LET A$(4)="[illegible]"
  70 LET A$(5)="[illegible]"
  80 LET A$(6)="[illegible]"
  90 LET A$(7)="[illegible]"
 100 LET A$(8)="[illegible]"
 110 LET A$(9)="[illegible]"
 120 LET A$(10)="[illegible]"
 130 LET A$(11)="[illegible]"
 140 LET A$(12)="[illegible]"
 150 LET A$(13)="[illegible]"
 160 LET A$(14)="[illegible]"
 170 LET A$(15)="[illegible]"
 180 LET A$(16)="[illegible]"
 190 LET A$(17)="[illegible]"
 200 LET A$(18)="[illegible]"
 210 LET A$(19)="[illegible]"
 220 LET A$(20)="[illegible]"
 230 LET A$(21)="[illegible]"
 240 LET A$(22)="[illegible]"
 250 LET A$(23)="[illegible]"
 260 LET A$(24)="0111000000000"
```

```
 270 LET A$(25)="[illegible]"
 280 LET A$(26)="[illegible]"
 290 LET A$(27)="[illegible]"
 300 LET A$(28)="[illegible]"
 310 LET A$(29)="[illegible]"
 320 LET A$(30)="[illegible]"
 330 LET A$(31)="[illegible]"
 340 LET A$(32)="[illegible]"
 350 LET A$(33)="[illegible]"
 360 LET A$(34)="[illegible]"
 370 LET A$(35)="[illegible]"
 380 LET A$(36)="[illegible]"
 390 LET A$(37)="[illegible]"
 400 LET A$(38)="[illegible]"
 410 LET A$(39)="[illegible]"
 420 LET A$(40)="[illegible]"
 430 LET A$(41)="[illegible]"
 440 GO SUB [illegible]
 450 CLS : GO SUB 1050
 460 PAPER P: INK N: BRIGHT M: FLASH S:
CLS
 470 PRINT AT 11,0;" NOW INITIALISE VAR
IABLES FOR       FIRST PRINT LINE
          (PRESS ANY KEY)          ": P
AUSE 0
 480 CLS : GO SUB 1050
 490 PRINT #1;"LOAD A SCREEN? (Y/N)": PA
USE 0
 500 IF INKEY$="" THEN GO TO 500
 510 IF INKEY$="Y" OR INKEY$="y" THEN I
NPUT "FILENAME ";F$: LOAD F$SCREEN$
 520 INPUT "COMPRESSED(1) OR LARGE(2)?"
;H
 540 IF H<1 OR H>2 THEN GO TO 520
 550 IF H=1 THEN GO TO 590
 560 INPUT "WHICH ROW? (1 TO 13) ";E
 570 IF E<1 OR E>13 THEN GO TO 560
 580 GO TO 610
 590 INPUT "WHICH ROW? (0 TO 13) ";E
 600 IF E<0 OR E>13 THEN GO TO 590
 610 LET D=(13-E)*12.5
 620 INPUT "WORDS ": LINE E$
 630 LET F=0
 640 FOR I=1 TO LEN E$
 650 RESTORE 9000+(CODE E$(I TO I)-65)*1
0: READ G: LET F=F+G
 660 NEXT I
 670 LET L=1: LET F=F-4
 680 PRINT #1;"LENGTH OF STRING ";F: IF
F>256 AND H=2 THEN PAUSE 100: GO TO 560
 690 IF F>256 AND H=1 THEN PAUSE 100: G
O TO 590
 700 PAUSE 100
 710 INPUT "AUTO CENTRE(1) OR MANUAL(2)?
";Q
 720 IF Q<1 OR Q>2 THEN GO TO 710
```

```
8760 DATA 9,7,7,23,24,24,24,24,24,24,24,
24,24,23: REM >
8780 DATA 15,7,7,7,7,25,25,4,4,25,25,7,7
,7: REM •
8790 DATA 7,37,38,23,23,7,7,7,7,7,7,7,7,
7: REM ,
8800 DATA 13,7,7,7,7,7,7,1,1,7,7,7,7: RE
M -
8810 DATA 7,7,7,23,23,7,7,7,7,7,7,7,7,7:
 REM .
8825 REM LINES 8830 TO 8920 ARE
 THE NUMERALS 0 TO 9
8830 DATA 17,7,7,1,2,2,3,3,3,3,3,2,2,1:
REM 0
8840 DATA 13,7,7,13,13,13,13,13,13,13,13
,17,17,20,20: REM 1
8850 DATA 17,7,7,2,2,2,5,4,12,15,3,2,2,1
: REM 2
8860 DATA 17,7,7,4,2,2,6,2,4,2,6,2,2,4:
REM 3
8870 DATA 17,7,7,6,6,6,2,2,2,3,3,3,3,21:
 REM 4
8880 DATA 17,7,7,4,2,2,6,2,2,4,5,2,2,2:
REM 5
8890 DATA 17,7,7,1,2,2,3,2,2,4,5,2,2,12:
 REM 6
8900 DATA 17,7,7,19,19,13,13,22,22,6,6,2
,2,2: REM 7
8910 DATA 17,7,7,1,2,2,3,2,1,2,3,2,2,1:
REM 8
8920 DATA 17,7,7,4,2,2,6,12,2,2,3,2,2,1:
 REM 9
8930 DATA 7,7,7,23,23,7,7,7,7,7,23,23,7,
7: REM :
8940 DATA 7,37,38,23,23,7,7,23,23,7,7,7,
7,7: REM ;
8950 DATA 13,7,7,7,27,26,41,40,39,40,41,
26,27,7: REM <
8960 DATA 13,7,7,7,7,7,17,17,7,17,17,7,7
,7: REM =
8970 DATA 13,7,7,7,37,38,39,40,41,40,39,
38,37,7: REM >
8980 DATA 17,7,7,13,13,7,13,13,13,22,3,2
,2,1: REM ?
8990 REM LINES 9000 TO 9250 ARE
 THE UPPER CASE LETTERS          A TO Z
9000 DATA 17,7,7,3,3,2,2,2,3,3,3,2,2,1
9010 DATA 17,7,7,4,2,2,3,2,4,2,3,2,2,4
9020 DATA 17,7,7,1,2,2,3,3,5,3,3,2,2,1
9030 DATA 17,7,7,4,2,2,3,3,3,3,3,2,2,4
9040 DATA 17,7,7,2,2,2,5,2,2,2,5,2,2,2
9050 DATA 17,7,7,5,5,5,5,4,4,4,5,2,2,2
9060 DATA 17,7,7,12,2,2,3,2,2,5,3,2,2,1
9070 DATA 17,7,7,3,3,3,3,2,2,2,3,3,3,3
9080 DATA 9,7,7,5,5,5,5,5,5,5,5,5,5,5
9090 DATA 17,7,7,1,2,2,3,3,3,6,6,6,6,6
9100 DATA 17,7,7,3,3,3,1,1,2,4,2,3,3,3
9110 DATA 15,7,7,4,4,4,5,5,5,5,5,5,5,5
9120 DATA 25,7,7,11,11,11,11,11,11,11,11
,10,10,9
9130 DATA 17,7,7,3,3,3,3,3,3,3,3,2,2,4
9140 DATA 17,7,7,1,2,2,3,3,3,3,3,2,2,1
9150 DATA 17,7,7,5,5,5,5,4,2,2,3,2,2,4
9160 DATA 17,7,7,12,2,2,3,3,3,3,3,2,2,1
9170 DATA 17,7,7,3,3,3,3,4,2,2,3,2,2,4
9180 DATA 17,7,7,4,2,2,6,12,2,4,5,2,2,12
9190 DATA 17,7,7,12,13,12,12,13,13,13,13
,2,2,2
9200 DATA 17,7,7,12,2,2,3,3,3,3,3,3,3,3
9210 DATA 17,7,7,13,1,2,3,3,3,3,3,3,3,3
9220 DATA 25,7,7,9,10,10,11,11,11,11,11,
11,11,11
9230 DATA 17,7,7,3,3,3,3,2,1,2,3,3,3,3
9240 DATA 17,7,7,13,13,13,13,1,2,2,3,3,3
,3
9250 DATA 17,7,7,2,2,2,18,17,1,16,15,2,2
,2
9310 REM LINES 9320 TO 9570 ARE
 THE LOWER CASE LETTERS          a TO z
9320 DATA 17,7,7,12,2,2,3,3,3,2,2,12,7,7
9330 DATA 17,7,7,4,2,2,3,3,3,2,2,4,5,5
9340 DATA 17,7,7,1,2,2,3,5,3,2,2,1,7,7
9350 DATA 17,7,7,12,2,2,3,3,3,2,2,12,6,6
9360 DATA 17,7,7,12,2,2,5,2,3,2,2,1,7,7
9370 DATA 15,7,7,5,5,5,5,17,17,17,5,17,1
7,19
9380 DATA 17,4,2,2,6,12,2,2,3,2,2,12,7,7
9390 DATA 17,7,7,3,3,3,3,3,3,2,2,4,5,5
9400 DATA 9,7,7,5,5,5,5,5,5,5,5,5,7,7
9410 DATA 13,19,17,17,13,13,13,13,13,13,
13,13,7,7
9420 DATA 17,7,7,3,3,3,3,4,17,4,3,3,5,5
9430 DATA 9,7,7,5,5,5,5,5,5,5,5,5,5,5
9440 DATA 25,7,7,11,11,11,11,11,11,10,10
,36,7,7
9450 DATA 17,7,7,3,3,3,3,3,3,2,2,1,7,7
9460 DATA 17,7,7,1,2,2,3,3,3,2,2,1,7,7
9470 DATA 17,5,5,4,2,2,3,3,3,2,2,4,7,7
9480 DATA 17,6,6,12,2,2,3,3,3,2,2,12,7,7
9490 DATA 15,7,7,5,5,5,5,5,18,4,4,8,7,7
9500 DATA 17,7,7,4,2,2,15,1,18,2,2,12,7,
7
9510 DATA 13,7,7,20,17,17,5,5,5,17,17,17
,5,5,5
9520 DATA 17,7,7,1,2,2,3,3,3,3,3,3,7,7
9530 DATA 17,7,7,13,1,2,3,3,3,3,3,3,7,7
9540 DATA 25,7,7,36,10,10,11,11,11,11,11
,11,7,7
9550 DATA 17,7,7,3,3,3,2,1,2,3,3,3,7,7
9560 DATA 17,6,6,12,2,2,3,3,3,3,3,3,7,7
9570 DATA 17,7,7,2,2,2,19,13,22,2,2,2,7,
7
9780 DATA 25,10,10,10,10,10,10,10,10,10,
10,10,10,10: REM SOLID BLOCK
9900 CLS : PRINT AT 0,5;"SCREENAID INSTR
UCTIONS"
9910 PRINT AT 2,0;"SCREENAID ALLOWS YOU
TO COMPOSE LOADING SCREENS OR PRINTER CO
PY IN TWO DIFFERENT STYLES AND     SIZES
 OF LETTERING."
9920 PRINT AT 6,0;"YOU CAN CONTROL THE F
OLLOWING   ATTRIBUTES DURING THE PROCESS
."
9930 PRINT AT 8,0;"PAPER COLOUR, INK COL
OUR, FLASH,BRIGHT."
9940 PRINT AT 10,0;"THE PROGRAM ALLOWS Y
OU TO PRINT ON FOURTEEN LINES (0 TO 13)
    THE COMPRESSED TYPE IS ONE LINE HIGH
. THE LARGE TYPE TAKES UP    TWO LINES."
9960 PRINT AT 15,0;"THERE ARE ERASE,SAVE
,COPY,RESET,CONTINUE AND QUIT OPTIONS.
                                   PRES
S ANY KEY TO INITIALISE    ATTRIBUTES."
: PAUSE 0
9970 RETURN
```

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INFINITE COLOURS

by Carl Whalley

Did you know that the only colours a colour TV tube can produce directly are red, green and blue? So how come there appears to be an infinite variety of colours on the screen when you sit down to watch your colour telly? The answer lies in the way the individual dots are arranged on the screen, their comparatively minute size and most importantly a human quirk of biology.

It so happens that when your eye sees two colour elements next to each other, and you are sufficiently far away, your brain is 'fooled' into thinking only one colour is present. This colour is a blend of the two actual colours present and the result is a new, third colour. For example if two dots are red and green, the observed 'secondary' colour will be yellow. So varying the proportions of the three primary colours on a screen 'fools' the eye into believing a veritable rainbow is displayed.

OK, so what is this fascinating information doing in a computer mag? Because it is possible to project these ideas of producing new 'secondary' colours from the fundamental 'primaries' on to the Amstrad (or any pixel-definable colour computer), and display colours not directly available with the use of the *Ink* (or equivalent) command. In Amstrad's case we have 27 possible primaries, so the result of blending these will result in many subtle variations of the one basic colour produced.

To achieve the blending effect the program creates a 'chessboard' pattern, with the dots alternating between the two colours on alternating lines. This is done by defining a character as the required pattern and printing it in one Ink on a background of another Ink, filling the top three-quarters of the screen. Then the user is able to set each ink to any of the 27 possible colours. Note at this point that certain colour combinations produce strong interference patterns on the screen, which appear as curved bands running from top to bottom. Whilst being very pretty in their own right they do rather distract from the concepts presented in this article.

Included is a feature to alternate between pixel resolution (low, medium, high) and the patterns seems to be more pronounced as the resolution increases. 'Autoflash' will loop through all the possible combinations at the set speed, and *'D'* sets this speed.

Uses? You could display more colours in the higher resolution modes than is otherwise possible (for example Knight Lore is ■ *Mode 1* — count the colours seen, though). In fact, it should be possible to create even more colours than described here with the use of more pixels per secondary. So don't dither about, blend it and create colours never before seen by the human eye!

```
1 REM PRINT ALL £ SIGNS AS HASHES (SHIFT/3)
10 PEN 3
20 CLS:PRINT"This program will interlace 2 pixelco
lours in a crosshatch pattern in order to produce a
 new colour."
30 PEN 1
40 PRINT:PRINT"When running the program enter ink
colours in response to the prompts, or enter an op
tion in response to the ink prompt.'
60 PEN 2
70 PRINT:PRINT"Options:"
80 PRINT"A - automatic colour cycling
90 PRINT"S - swap pixel resolution (lo,med,hi)"
100 PRINT"D - delay speed"
110 PRINT"Q   quit program"
120 PEN 1
130 PRINT
140 PRINT "Enter the initial delay speed for the a
uto mode (typically 100)  ";:INPUT delay$:delay=VA
L(delay$)
150 INK 0,1:INK 1,24
160 INK 2,15:INK 3,19
170 WINDOW £1,1,40,21,25:CLS £1
180 WINDOW £2,1,40,1,20:PAPER £2,0:CLS £2
190 REM pixel dither 2
200 SYMBOL 255,&CC,&33,&CC,&33,&CC,&33,&CC,&33
210 SYMBOL 254,&AA,&55,&AA,&55,&AA,&55,&AA,&55
220 SYMBOL 253,&F,&F0,&F,&F0,&F,&F0,&F,&F0
230 LOCATE 1,1:flag=0
240 GOTO 370
250 REM
260 PEN 1:LOCATE £1,8,2:PRINT £1,"Ink 1 ";:INPUT £
1,ink1$:IF ink1$="S" THEN 370 ELSE IF ink1$="A" TH
EN 280 ELSE IF ink1$="D" THEN 420 ELSE IF ink1$="Q
" THEN CLS:END ELSE INK 2,VAL(ink1$):LOCATE £1,22,
2:PRINT £1,"Ink 2 ";:INPUT £1,ink2$:INK 3,VAL(ink2
$)
270 GOTO 260
280 FOR ink1=0 TO 26:FOR ink2=0 TO 26
290 FOR del=1 TO delay:NEXT
300 IF INKEY$<>"" THEN 340
310 INK 2,ink1:INK 3,ink2
320 LOCATE £1,8,4:PRINT £1,ink1:LOCATE £1,22,4:PRI
NT £1,ink2
330 NEXT:NEXT
340 WHILE INKEY$="":WEND
350 LOCATE £1,8,4:PRINT £1,SPC(20)
360 GOTO 260
370 PEN £2,2
380 IF flag=2 THEN 390 ELSE IF flag=1 THEN 410 ELS
E 400
390 LOCATE £2,1,1:FOR position=1 TO 800:PEN 2:PRIN
T£2,CHR$(254);:NEXT:flag=1:GOTO 250
400 LOCATE £2,1,1:FOR position=1 TO 800:PEN 2:PRIN
T£2,CHR$(255);:NEXT:flag=2:GOTO 250
410 LOCATE £2,1,1:FOR position=1 TO 800:PEN 2:PRIN
T £2,CHR$(253);:NEXT:flag=0:GOTO 250
420 LOCATE £1,8,2:PRINT £1,"Delay ";:INPUT £1,dela
y$:delay=VAL(delay$):LOCATE £1,8,2:PRINT £1,"
              ":GOTO 260:REM 14 spaces
```

detected, and then use a special number to trigger the sequence (*N* in the example below) which would be followed by the byte to be repeated and the number of repetitions. So 68,80, 2,2,2,2,2,56,56,56,56 would become 68,80,N,2,5,N,56,4. This is, in fact, the method used by my program.

If the trigger *N* occurs in the original screen memory, it has to be stored as *N,N,1* so that the decompression routine will work correctly. For this reason it is a good idea to choose a value for *N* that is fairly uncommon - I eventually picked on 250 as being an unlikely combination of colours in the various graphics modes.

So that the compression and decompression routines worked quickly it was fairly obvious that they would have to be written in machine code; the completed code has been stored as a series of hex codes from Line 400 to 590.

Once typed in, the program should be saved before attempting to use it. Tape users should now make sure they have enough blank space (around four blocks) to record the compressed demo screen on.

The first few times the program is run you may find it stops and says *"Checksum error"*. This means you have made a mistake, either in PROCassemble or the data lines, and you should check through and correct it before trying to run the program again.

Once it runs successfully the demo screen will be drawn and tape users should press Record/Play, etc., followed by Return as normal; no message is displayed in order not to disturb the screen picture.

The demo screen will then be compressed and saved to the tape or disc, under the filename "S.DEMO". If this does not seem to have worked correctly check through the rest of the program carefully. If the compression system is working correctly the screen should have been compressed from a massive 20480 bytes to around 970 - ie, the screen is now stored in under 5% of the original memory!

After the screen has been compressed and saved you will be prompted to press the space bar - tape users should rewind the tape before doing this.

The compressed screen will then be loaded back in and decompressed, block by block.

Program Notes

To use the routines in your own programs you will need to incorporate PROCcall, PROCassemble and data lines into the program. You should also include a line calling PROCassemble near the start of the program, so that the machine code can be assembled into memory.

Now whenever you want to save or load a compressed screen to or from a tape/disc, you will need to use PROCcall.

PROCcall takes four parameters - F$,S%,F%, and O% where:

F$ is the filename the screen is to be saved under.

S% is the starting place in memory of the screen to be compressed.

F% is the finishing place in memory of the screen to be compressed.

O% determines the operation - 0 for compression, 1 for decompression.

The starting and finishing points for graphics Modes 0,1 and 2 are &3000 and &7FFF respectively; for Modes 4 and 5 they are &5800 and &7FFF respectively.

The machine code is assembled at &C00, is 160 bytes long and is relocatable. In addition zero page locations &70-&7A are used as general workspace by the routine.

Because the machine code is assembled at &C00, the user-defined characters area, you will run into problems if you try to define any characters.

If you wish to do this, you must re-position the code by changing P% in Line 310.

Perhaps the safest way to find a new value for P% is to go into the Mode you are going to be using and type PRINT HIMEM-&100. Reset HIMEM to this figure after any Mode changes, and set P% to this in Line 310.

Other possibilities include &800 if you are prepared to forsake the function key facility; &D02 for tape users; and &900 or &A00 for disc users.

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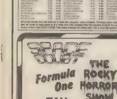

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THE MEANING OF THE UNIVERSE

EXTENDED BASIC

by Eric Deghaye

Last week we looked at how we can tap in the Basic interpreter and introduce our own commands. But a problem appeared on how to control a large number of commands while still having a program that can be easily changed to particular needs.

One of the ways of solving that problem is by using some sort of 'Look-up' table. The idea is a bit like using a phone directory: if you want to contact someone, the first thing you do is to look for their name in the directory. If it is not there then they do not possess a telephone. But if you find the name then you can look on the adjacent column for the number. I will use a similar technique here: we take a character from the Basic text and compare it to all our possible commands. If a match is found, the address of the particular routine concerned is found in an adjacent table. The address is picked up, and the program jumps to that particular address. After execution of that routine, control is given back to the Basic interpreter.

In the event that no match is found in the table, the program will jump back to the routine which executes a 'standard' Basic statement.

The program is divided into five parts. The first is just the initialisation and the change of the vector address. Then next we have the routine that checks if we have a valid command, followed by the routine that gets the address of the particular routine.

Next we have the routines themselves which are called from Basic, (I will refer to these from now on as 'modules'), and finally the various tables containing the possible commands and the addresses.

The very last part is a routine that will create the address table, and once your extensions have been completed and tested and your table is filled, you can delete this routine, but it is most useful if you want to assemble at other addresses than $C000.

Program Notes

Whenever the return key is pressed, the characters typed in are checked by the program. What is checked first is an identifier character, in this case an exclamation mark (this saves looking through the whole table for every character).

If the character is truly a '!' then we check on the following character by going through the whole table and looking for a match. Once a match is found, the position of the command in the table will be held in *x*. We then use the content of *x* to get the address of the module, and jump to that particular address. Simple isnt' it? . . .

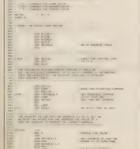
The modules included will work as follows:

!b will change the colour of the border
!s will change the colour of the screen
!c will change the colour of the character

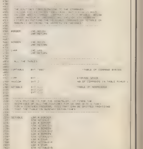
After initialising the extension, try and run the following basic program: 10 for n = 0 to 20 20 print "hello" 30 !c: !s: !b 40 next n.

This should flash the screen whilst writing in different colours the word hello.

More next week.



```
100 ;****************************************
120 ;      BASIC EXTENSIONS NUMBER 1 ..
140 ; .. THE EXTENSIONS ROUTINE SELECTION ..
160 ;****************************************
180 ;
200 ;  "!C" CHANGES THE CHAR COLOR
220 ;  "!B" CHANGES THE BORDER COLOR
240 ;  "!S" CHANGES THE SCREEN COLOR
260 ;
280 GETVAL       = $0073
300 *=$C000
320 ;
340 ;------------------------------------------
360 ; RESET THE BASIC LOOP VECTOR
380 ;------------------------------------------
400 ;
420              LDA #<CHECK
440              STA $0308
460              LDA #>CHECK
480              STA $0309
500              JSR SETABLE              ;SETUP ADDRESS TABLE
520              RTS
540 ;
560 ;------------------------------------------
580 ;
600 CHECK        JSR GETVAL               ;CHECK FOR CONTROL CHAR
620              CMP #"!"                 ;IS IT A !
640              BNE EXIT
660 ;------------------------------------------
680 ; THE FOLLOWING ROUTINE CHECKS THROUGH A TABLE OF
700 ; ALL THE POSSIBLE COMMANDS. IF A VALID COMMAND IS RECOGNISED
720 ; THEN THE ADDRESS OF THE RELEVANT ROUTINE IS OBTAINED
740 ; FROM ANOTHER TABLE
760 ;------------------------------------------
780 ;
800              JSR GETVAL
820              STA COMP                 ;SAVE THE POTENTIAL COMMAND
840              LDX MAXCOM
860 LOOP         LDA COMTABLE,X           ;GET POSSIBLE COMMAND
880              CMP COMP                 ;IS IT THIS ONE?
900              BEQ GETADR               ;YES THEN GET ADDRESS
920              DEX
940              BPL LOOP
960 EXIT         JMP $A7E7                ;NO MATCH THEN GO BACK
980 ;
1000 ;------------------------------------------
1020 ; THE POINTER TO THE ROUTINE ADDRESS IS IN X, BUT AS
1040 ; WE NEED TWO BYTES FOR THE ADDRESS THE VALUE OF X
1060 ; MUST BE DOUBLED TO ACCESS THE CORRECT ADDRESS
1080 ;------------------------------------------
1100 ;
1120 GETADR      TXA
1140             ASL A                    ;DOUBLE THE VALUE
1160             TAY
1180             LDA ADTABLE,Y            ;GET ADDRESS OF ROUTINE
1200             STA $FB                  ;STORE IT IN ZERO PAGE
1220             LDA ADTABLE+1,Y
1240             STA $FC
1260             JMP ($FB)                ;GO TO OUR ROUTINE
1280 ;
```



```
1300 ;------------------------------------------
1320 ;
1340 RETURN      JSR $0073                ;THE END
1360             JMP $A7AE                ;THE END
1380 ;
1400 ;------------------------------------------
1420 ; THE ROUTINES CORRESPONDING TO THE COMMANDS
1440 ; [illegible]
1460 ; [illegible]
1480 ; [illegible]
1500 ; [illegible]
1520 ; [illegible]
1540 ;------------------------------------------
1560 ;
1580 BORDER      INC $D020
1600             JMP RETURN
1620 ;
1640 ;
1660 SCREEN      INC $D021
1680             JMP RETURN
1700 ;
1720 CHAR        INC 646
1740             JMP RETURN
1760 ;
1780 ;------------------------------------------
1800 ;  ALL THE TABLES
1820 ;------------------------------------------
1840 ;
1860 COMTABLE    BYT "BSC"                ;TABLE OF COMMAND SYNTAX
1880 ;
1900 ;
1920 COMP        BYT 0                    ;STORAGE SPACE
1940 MAXCOM      BYT 2                    ;NO.OF COMMANDS IN TABLE MINUS 1
1960 ;
1980 ADTABLE     BYT 0,0                  ;TABLE OF ADDRESSES
2000             BYT 0,0
2020             BYT 0,0
2040 ;
2060 ;------------------------------------------
2080 ; THIS ROUTINE IS FOR THE ASSEMBLER. IT FINDS THE
2100 ; ADDRESSES OF ALL THE ROUTINES FOR US AND SETS A TABLE
2120 ; FOR A FINISHED PROGRAM, THIS PART CAN BE OMITTED PROVIDING
2140 ; THAT THE TABLE IS ALREADY ESTABLISHED
2160 ;------------------------------------------
2180 ;
2200 SETABLE     LDA #<BORDER
2220             STA ADTABLE
2240             LDA #>BORDER
2260             STA ADTABLE+1
2280             LDA #<SCREEN
2300             STA ADTABLE+2
2320             LDA #>SCREEN
2340             STA ADTABLE+3
2360             LDA #<CHAR
2380             STA ADTABLE+4
2400             LDA #>CHAR
2420             STA ADTABLE+5
2440             RTS
2460 ;
```

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Twice as difficult

An interesting review package arrived on my desk the other day – a Spectrum 128 version of *Three Weeks in Paradise* from Mikro-Gen together with a note apologising about not announcing it sooner. You may have noticed that after *Shadow of the Unicorn*, the much publicised range of Mikro - Plus games disappeared, or rather did appear but without the extra memory.

Now it seems that all the effort in producing the games has not been wasted and there is still the option of making it at least twice as difficult for yourself to rescue Wilma and the rest. (Incidentally if you aren't tired [illegible] the characters yet, [illegible] is better than any Wally game to date, showing a refinement of all the techniques used. Highly recommended to any 128 owner).

What I can't understand is why the Spectrum 128 is getting a lot of new games software that uses all the memory, but the Amstrad and Commodore 128K machines have very little. Perhaps it's because they have more disc software instead so you get the same effect in the end or perhaps a lot of Spectrum software writers have been released from the paranoia that they were really reaching the limits of its abilities.

On with the tips. Mark Weatherill of Leighton Buzzard writes, "I have been looking at *Repton* for the BBC and Electron by Superior Software and have discovered the following.

"If you type *!&17FE+ &EAEAEAEA* then *Call&6700* to start the game you will be able to see all of the maps.

"To redesign any of the maps you need to find the codes by which they are represented in memory.

"The maps are all 32 × 32 blocks in size but there are only 32 different blocks, so each map can be represented by a five-bit binary code. This reduces the size of the map in Ram to only 640 bytes. Each line can therefore be represented by 160 bits or [illegible] bytes.

"Reading from right [illegible] left, if you add each five-bit sequence in turn it will produce a long string of bits 20 bytes long. Repeat for all the 32 lines of the map and you will end up with 640 bytes in all.

"There is one final trick though, when they are stored in memory each byte has to have the order of its bits reversed.

"By experimenting with this system you will find that you can discover the way the maps are created and can be stored. To find out which code belongs to which block on the map, create a dummy which uses all the five-bit codes 00000 to 11111 in turn and note the results.

"To load a new map into the game in place of the existing maps you must **Load* the last part of the program to address *&1100*. The first map will then be at *&4900*, the second 640 bytes after this, etc.

"For anyone who thinks they will find this difficult, I have produced a program that will let new *Repton* maps be created on screen and compacted. If anyone is interested I would be happy to negotiate a sale."

Thanks very much for that, Mark. If anyone wants to get in touch write to him at 72 Chamberton Road, Linslade, Leighton Buzzard, Bedfordshire LU7 7UP.

John Buckley of Liverpool has sent in a couple of useful tips for games without actually specifying which machine they run on. The choice is between Spectrum and Amstrad although I expect that he actually has a Spectrum. Even so the tips may work for both machines.

"To see all of the rooms in *Cauldron* by Palace Software go into any underground room and then press the *O* key. You should then see a cursor appear on the bottom of the screen.

"Next type in any number from 0 to 50 to see all of the rooms. If you type 101 you will be in the Golden Broom room on top [illegible] the pumpkin. All you then have to do is jump right on to the broom to see the special message for those who have finished the game.

"You cannot get a top score in *Sweevo's World* unless you approach things the correct way. On the second floor down there is a brownie on top of two blocks that looks completely impossible to reach. To get to it go down to level three and go around until you find a room with three skulls in it. In between these you will find a jump pad. You must drop two objects on to the pad so that they fly up a floor. Then stand on it yourself and you will come to land on top of the two objects in the impossible brownie room.

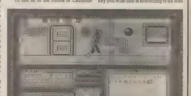
"A bug occurs when you pick up the brownie and the two objects. Sometimes when walking off in a certain direction you will start to go all over the place and the only way to stop it is to reset the machine and load the program again.

"But I have found that you can stop this happening by getting the brownie before any other creature."

That's a timely tip for those of you who will be receiving your *Arcade Champion's Handbook* about now.

Paul Lynch, also of Liverpool and one M A Reece of Stoke have both written with some pleas for help with that other excellent Gargoyle game, *Marsport*. Again a complete map and helpful hints will be found in the *Arcade Champion's Handbook* but for now here are some solutions to your particular problems.

The reference to *The game is the clue* etc, in the games room means that the key you must find is something to do with games. Try collecting the stepladder and the calculator (ie, the adder – geddit?) both of which you should have found by now and factor these.



Marsport from Gargoyle Games

This is a typical example of the dreadful puns that permeate the whole game. Another is the use of boots to get into the chemists (groan!).

When you get to sanctuary take note of the message about 'things alien' – if you use this clue wisely you will find a connection between three objects that can be factored to give your game a boost.

Tony Kendle

Evesham Micros

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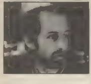


Easy system

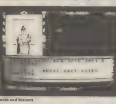
Over the past few years, Adventure Corner has been host [illegible] many *Quill*'d games, most of them written for the Spectrum – I've seen one for the Commodore, and one for the Atari, which I shall be looking at in more detail as soon as I can resurrect my Atari!

The Amstrad has its own version [illegible] *The Quill*, but I have yet to see an adventure from this source: Incentive's *GAC* is, I think, rather more attractive to the novice, and I'm sure that we'll see a lot more adventures from this source in the future, although the newer versions of Camel/CRL's *Genesis* may prove to be even better value.

Linda Wright, who is also known as the House Elf, is the first reader to send me a *GAC*'d game: her adventure is called *Sharpe's Deeds*, and concerns your quest, as the heir to great-uncle Ferdinand Sharpe, to find the [illegible] treasures of his bequest and thus complete an unknown task.

I hope that Linda will forgive me making mention of her adventure here, as I believe that she has not started to market the game, and in fact has asked me for advice in this regard. Good adventures will always find a market, but to get your game widely known, I would advise you to approach a *well-known* adventure label. If they don't like your game, and you believe in it, then keep plugging away (but don't let any company keep your game for more than four weeks or so without a firm reply). If your adventure is better than the average, you will eventually get a release – and [illegible] is obviously better to let a professional company handle all the necessary advertising and promotion, without which games just can't be sold in large numbers nowadays.

Linda makes some pertinent comments regarding *GAC*: "I have found *GAC* easy [illegible] use and flexible. I needed a system that was easy to understand - as for all the planning on paper that Kevin Marks complained of (*PCW*, Vol 5 No 2), surely that is a necessary requirement in producing any adventure (and part of the fun?). As for T Corby's criticism (Vol 5 No 4) that altering the map during play is impossible, it isn't, as I have done so in *Sharpe's Deeds*. [illegible] takes a little thought, [illegible] course: hidden rooms, new exits and so on have [illegible] be regarded as objects and brought in when the player has disposed of the obstacle. My main criticism of *GAC* arises from not being able [illegible] use as many locations with graphics as they claim - how would you be able to have 9999 rooms with graphics and still be able [illegible] play any worthwhile adventure? It would also be nice if you could have a title screen to watch while the program was loading. Little points I know: mostly, I'm pleased that I bought *GAC* and plan to use it frequently."



Swords and Sorcery

Linda's program is an attractive game, although the plot is not wholly original: the problems that you'll find are nicely logical yet diverting. With plenty of well-illustrated locations [illegible] be explored, *Sharpe's Deeds* is a good introduction to adventuring to anyone who has just invested in an Amstrad. An interesting aspect of the game is that other characters in the scenario have to be spoken to and questioned; only by doing this will you come into possession of items necessary to your further progress in the adventure. The adventure was written on Linda's CPC464, and isn't, therefore, 100% compatible with my 6128: the occasional strange hieroglyphic shows up, but fortunately, this doesn't detract too much from the general proceedings. The graphics are nicely drawn, and Linda has resisted the temptation to create very detailed, memory-consuming pictures, preferring rather to stick to simple line-drawings. These are, however, quite adequate – I can't wait, though, to see what authors might be able to do with disc storage, when they will be able to call in pictures as required from disc rather than Ram.

I'll return to *Quill*'d and *GAC*'d adventures at a later date, as I still have several hiding in the In tray, but for now, there's just space to mention a D&D program for the Beeb. Many readers have asked me over the years "do you know of a good old D&D bash about?", and I have to say that there are not too many about, apart from the obvious *Swords and Sorcery*. The BBC has been particularly starved of such a program, but now Epic Adventures has come [illegible] the rescue with *Demonic World Entrance to Hades*, written by Clive Hedley.

This Monster and Dungeon Creator [illegible] disc-based, and extraordinarily colourful. It's also very loud, boasting many very jolly tunes (and they get jolly irritating, too, as these things do after [illegible] while!). The manual that arrived with the program seems to be a pre-production copy – I hope so, as the general tone is unbearably condescending and totally unfunny, not rising far above the level of "Switch on the black-keyed object called a computer".

If you can resist the temptation to throw up, then you're in for a treat.

Several modules allow, first of all, for the creation of characters (Fighter, Lord, Cleric, Ninja and so on), armour, weapons (battle-axe, dagger, sword) and spells (Hammer of Might, Invisibility etc), and then on to setting up the map for the adventure, which, as you can guess by now, is mostly combat-orientated. A maximum of 255 rooms can be set up, with 124 objects. These objects include 30 'gettable' items, potions, monsters and so on. A list of recognised words is then drawn up. Set up is accomplished by several very attractive and easy-to-use menus and alterations can be made at any time.

The final adventure is a must for any Bash 'n' Slash devotee; at just £8, it's surely the best value around for the Beeb D&D'er. Epic Adventures, PO Box 85C, Esher, Surrey.

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Peek & Poke

Off the screen

Simon Jay, of Solihull, writes:

Q Can you explain why, when using *Poke 1024 x 40*x,46* in a program for moving a character on the screen, the program stops working if the character goes off the screen.

A Firstly you have to think what it is you are actually doing.

You are poking the screen display file with data. If your character has disappeared off the screen then you must be poking somewhere outside the screen display area, and thereby corrupting another part of Ram, say, the program or variables area.

Try doing a few sums with values of z and x that take you outside the screen and see what part of memory you would be poking.

Spectrum keyboard

D M Williams, of Liverpool, writes:

Q Readers of Popular may be interested to know that Spectrum membranes can be purchased for around £5. They are easy to install and are available from spares retailers. In case people cannot find one in their area, I can provide two addresses: ZX Computers, Dale Street, Liverpool and, The Micro Workshop, 12 Station Approach, Epsom, Surrey.

A It is good to hear that the old Spectrum keyboard membranes are still available at a reasonable price. I wonder if the same is true for other 'rubber only' components?

Power supply

Marcel Fuhrer, of Berne, Switzerland, writes:

Q I own a Sinclair QL and I've the following problem: very often the cursor on the screen stops flashing and I have to reset the QL. This also happens when I work with Psion programs. All things which were typed in are lost. Perhaps I have a problem with the power supply, as on the continent I work with 220 volts.

A My guess is that your problem is either caused by: a) a faulty QL . . . I suggest that you get that checked out by a dealer if you can, or, b) a 'dodgy' power supply. If the supply fluctuates greatly this could cause Ram contents to be lost, even if only partially. There is not much I can suggest there, except that you could investigate the possibility of running your QL via some sort of battery.

Musical notation

Yenki Paasha from London writes:

Q I would like to play classical music on my Amstrad 128, but I don't know much about musical notation. Is there any way I can direct music from my cassette recorder into my computer, then by analysing the input, determine the music being played?

A There's no single answer to your question, but some options that might suit your requirements: You could look at a music package like Rainbird's *Music System* – this will allow you to compose music on the three channels of the Amstrad's sound chip in conventional music notation. Although you say you are not familiar with musical notation, you wouldn't find it too difficult to get hold of some music and enter it into the program. You could then listen to it and analyse it bit by bit.

You do have a problem when you specify 'classical' music as your interest with only three channels (three single voice instruments if you like). Most classical music is far too complex to replicate, although you might manage some simple Bach. My advice would be to seek out those special music score books which are designed for Casios, Yamahas, and other keyboards with 'easy play' facilities. Here the music is simplified such that you might be able to squeeze it into your machine.

As another answer to your question, it is theoretically possible to convert sound into digital information on your Amstrad.

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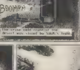
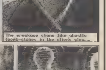
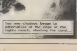


The crisp cold night of the desert was sliced by S.A.M.'s light.

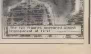


The wreckage shone like ghostly toomb-stones in the alien's glow....

S.A.M. SEEMED TO LOCK ON TO THE MAIN HULL AND BURN BRIGHTER....



Two new shadows began to materialise at the edge of the lights reach, shading the sand....



The two figures appeared almost transparent at first ....

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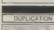

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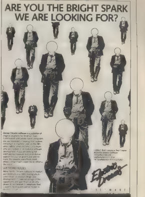

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Charts

Amstrad

1	(1)	Rambo	(Ocean)	£8.75
2	(6)	Mini Office 2	(Database)	£19.95
3	(–)	Tau Ceti	(CRL)	£9.95
4	(5)	Yie Ar Kung Fu	(Imagine)	£8.95
5	(4)	Formula One Simulator	(Mastertronic)	£1.99
6	(–)	Spitfire 40	(Mirrorsoft)	£9.95
7	(10)	One Man and his Droid	(Mastertronic)	£1.99
8	(2)	Sky Fox	(Ariolasoft)	£9.95
9	(8)	Finders Keepers	(Mastertronic)	£1.99
10	(–)	Music System	(Rainbird)	£15.95

Atari

1	(1)	One Man And His Droid	(Mastertronic)	£1.99
2	(2)	Action Biker	(Mastertronic)	£1.99
3	(5)	Fighter Pilot	(Digital Integration)	£9.95
4	(–)	Boulder Dash	(Database)	£9.95
5	(4)	Chimera	(Firebird)	£3.95
6	(6)	Spy vs Spy 2	(Databyte)	£9.95
7	(10)	Mercenary	(Novagen)	£9.95
8	(7)	Steve Davis Snooker	(CDS)	£8.95
9	(9)	Spy Hunter	(US Gold)	£8.95
10	(–)	Goonies	(US Gold)	£9.95

BBC

1	(1)	Yie Ar Kung Fu	(Imagine)	£9.95
2	(–)	Speech	(Superior)	£9.95
3	(8)	Strike Force Harrier	(Mirrorsoft)	£9.95
4	(5)	Citadel	(Superior)	£9.95
5	(–)	Dambusters	(Sydney/US Gold)	£9.95
6	(9)	Phantom Combat	(Doctorsoft)	£9.95
7	(–)	Hypersports	(Imagine)	£9.95
8	(4)	Lord of the Rings	(Melbourne House)	£9.95
9	(7)	Mini Office 2	(Database)	£14.95
10	(3)	Way of the Exploding Fist	(Melbourne House)	£9.95

Commodore 64

1	(–)	Uridium	(Hewson)	£8.95
2	(1)	Hardball	(US Gold)	£9.95
3	(2)	Yie Ar Kung Fu	(Imagine)	£8.95
4	(3)	Kung Fu Master	(US Gold)	£9.95
5	(4)	Electra Glide	(English)	£8.95
6	(8)	Eidolon	(Activision)	£9.95
7	(–)	Kane	(Mastertronic)	£1.99
8	(10)	Zoids	(Martech)	£8.95
9	(–)	Bounder	(Gremlin Graphics)	£9.95
10	(–)	Lord of the Rings	(Melbourne House)	£15.95

Spectrum

1	(4)	FA Cup Football	(Virgin)	£7.95
2	(1)	Movie	(Imagine)	£7.95
3	(2)	Sky Fox	(Ariolasoft)	£8.95
4	(–)	Barry McGuigan World Championship Boxing	(Activision)	£7.99
5	(–)	Incredible Shrinking Fireman	(Mastertronic)	£1.99
6	(3)	Hypersports	(Imagine)	£7.95
7	(7)	Winter Games	(Epyx/US Gold)	£7.95
8	(8)	Spellbound	(Mastertronic)	£2.99
9	(–)	Vectron	(Firebird)	£7.95
10	(5)	Commando	(Elite)	£7.95

All figures compiled by Gallup/Microscope

Top Twenty

1	(–)	Uridium *(C64)*	**Hewson**
2	(2)	Yie Ar Kung Fu *(Various)*	**Imagine**
3	(14)	Commando *(Spectrum/C64)*	**Elite**
4	(1)	Hardball *(C64)*	**US Gold**
5	(–)	FA Cup Football *(Spectrum/C64/Amstrad)*	**Virgin**
6	(4)	Rambo *(Spectrum/C64/Amstrad)*	**Ocean**
7	(7)	Sky Fox *(Spectrum/C64/Amstrad)*	**Ariolasoft**
8	(3)	Formula One Simulator *(Various)*	**Mastertronic**
9	(6)	One Man and his Droid *(Various)*	**Mastertronic**
10	(9)	Hypersports *(Various)*	**Imagine**
11	(8)	Movie *(Spectrum)*	**Imagine**
12	(11)	Action Biker *(Spectrum/C64/C16/Atari)*	**Mastertronic**
13	(–)	Steve Davis Snooker *(Various)*	**CDS**
14	(–)	Barry McGuigan World Championship Boxing *(Various)*	**Activision**
15	(–)	Big Mac *(C64/C16)*	**Mastertronic**
16	(–)	Lord of the Rings *(Spectrum/C64/Amstrad/BBC)*	**Melbourne House**
17	(12)	Finders Keepers *(Various)*	**Mastertronic**
18	(10)	Winter Games *(Spectrum/C64/Amstrad)*	**Epyx/US Gold**
19	(17)	Elite *(Spectrum/C64/Amstrad/BBC)*	**Firebird/Acornsoft**
20	(16)	Way of the Exploding Fist *(Various)*	**Melbourne House**

Figures compiled by Gallup/Microscope

Readers' Chart No 66

1	(2)	Elite *(Spectrum/C64/Amstrad/BBC)*	**Acornsoft/Firebird**
2	(3)	Commando *(Spectrum/C64/C16)*	**Elite**
3	(5)	Yie Ar Kung Fu *(Spectrum/C64/Amstrad/BBC/MSX)*	**Imagine**
4	(6)	Movie *(Spectrum)*	**Imagine**
5	(1)	Lord of the Rings *(Spectrum/C64/Amstrad)*	**Melbourne House**
6	(5)	Winter Games *(Spectrum/C64/Amstrad)*	**Epyx/US Gold**
7	(6)	Swords and Sorcery *(Spectrum/Amstrad)*	**PSS**
8	(–)	Spellbound *(Spectrum)*	**Mastertronic**
9	(–)	Spitfire 40 *(Spectrum/C64/Amstrad)*	**Mirrorsoft**
10	(9)	Rambo *(Spectrum/C64/Amstrad)*	**Ocean**

Winning Phrase No 66: "Trinidad steel from Gooch", from T E Bardis, of London SW14, who wins £25. An honourable mention goes to Michael Sleight, of Doncaster, for, "If Commodore goes, then darn it!"

Now voting on week 68 – £25 to win

Each week *Popular* is compiling its own special software top ten chart – compiled by YOU.

And each week we will send £25 to the person who sends in, with their chart votes, the most original (witty, neat or clever – but never rude) phrase or sentence made up from the letters (you don't have to use them all) in the titles of the top three programs in this week's Readers' Chart, published above.

You can still vote in the chart without making up a slogan – but you won't be in with a chance of winning the prize.

All you have to do is fill in the form below (or copy it out if you don't want to damage your magazine) and send it off to: Top 10, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP.

Voting for Week 68 closes at 2pm on Wednesday March 26, 1986. Entries received after that time will not be eligible for inclusion in that week's voting. The judges decision is final. Only one entry per individual per week will be allowed.

Name ....

Address ....

....

....

My top 3: Voting Week 68

1..

2..

3..

My phrase is: ....

New Releases

ENTERTAINING

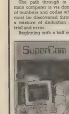
All things considered, there are very few games programs based around the idea of hacking into computers. Activision's *Hacker* seemed like it was, but wasn't really. Offhand, *System 1500* is the only example I can think of.

Room then for *SuperCom* for the Spectrum, a neat little program that has the additional advantage of being cheap at £1.99. It isn't terribly sophisticated, but it's surprisingly entertaining. The plot involves using your computer to find your way through a computer controlled by the usual criminal mastermind, who is holding the country to ransom with the usual nuclear warhead.

The path through to the main computer is via dozens of numbers and codes which must be discovered through a mixture of deduction and trial and error.

Beginning with a half completed number, you use a link analysis device on each new telephone line to give you bits of information about numbers and codes. When you ring a number, the Spectrum makes a reasonably fair impersonation of phone burbles and blips and if the number is correct, you are presented with a screen full of information that may contain more clues and more numbers.

It's not astounding – the screen displays are very Basic-looking and the instructions don't tell you vital things like the Z key is used to return to the main menu. Nevertheless, I think you'll be hooked.



Program *SuperCom*
Price *£1.99*
Micro *Spectrum*
Supplier *Atlantis Software*
19 Prebend Street
London N1 8PF

Pick of the week

ESSENTIAL BUY

There's no denying it, there is a disturbing trend for the production of blatantly flashy programs. 'Superb graphics and sound' say the glossy ads – it looks fabby in the shop – but when you get it home and load it up, it plays like a pig. Oh, that more games were like *Thrust*.

Programmed reputedly by a physicist (who does start these rumours?), its basic vector graphics make it look like an updated version of *Lunar Lander* or *Gravitar* and the sound during the action is, well, minimal. So what makes it the best release of its kind this year?

The scenario is straightforward enough . . . you have a ship (under constant gravity – downwards . . .) with a limited amount of fuel. You must manoeuvre through subterranean tunnels (picking up extra fuel – zapping/avoiding gun emplacements) to collect a heavy ball, which attaches to your ship via a rigid, but pivoting rod . . . this is the clever bit. The ball is much heavier than your ship, but swings free – does anyone remember momentum? Naturally, if you or the ball collide with the tunnel sides, you're dead. All you have to do then is get to the surface (you're not running out of fuel, are you?), blast the reactor (what reactor) and you have ten seconds to reach the top of the atmosphere.

Maybe it's the playability, maybe it's the responsiveness of the controls (keyboard only . . . this is the stuff) or maybe it's because it is so difficult. Whatever it is, at £1.99, it can be regarded as the essential purchase for the hardcore gamesplayer this year.

Program *Thrust*
Price *£1.99*
Micro *CBM 64*
Supplier *Firebird Software*
Wellington House
Upper St Martin's
Lane
London WC2H

UNUSUAL

Animator 1 is a rather unusual utility for the Spectrum that is more than a conventional artist type program and yet not a complete games designer. It is best thought of as a package to help with all the graphic display elements of game design.

The program is designed around a series of separate menus each called by a Cap-shifted key press. The most straightforward of these is *Design* which gives you airbrushes, variable cursor speed, colour, etc.

Line mode and Circle mode are subsets of this option, letting you draw basic outlines of shapes in the usual way. Print mode lets you shunt a line or text around and includes facilities to compress and alter the spacing between letters.

The *Screen Pack* contains a variety of options to manipulate the entire screen, shunting the bit image and/or attributes around by either pixel or single character.

Key to the program is the Sprite menu, which allows you to store sprite designs in memory, retrieve them and animate sprites by moving through a series of drawings at speed.

What does it all add up to? I'm not sure really. Certainly everything functions well and with a small amount of ma-

This Week

Program	Type	Micro	Price	Supplier
Batman	Arc	Amstrad	£8.95	Ocean
Panzadrome	Arc	Amstrad	£8.95	Ariolasoft
Revenge of the C5	Arc	Amstrad	£2.99	Atlantis
Way of the Tiger	Arc	Amstrad	£9.95	Gremlin Graphics
Kaiser	[illegible]	Amstrad	£7.95	Ariolasoft
Melbourne Draw	Ut	Amstrad	£14.95	Melbourne House
Steve Davis Snooker	S	Amstrad	£9.95	CDS
Project Thesius	Ad	Atari	£9.95	Robico
Brom Plus	Ut	BBC	£40	Clares
Fontwise Plus	Ut	BBC	£20	Clares
Macrom	Ut	BBC	£40	Clares
Bongo	Arc	C16/Plus 4	£6.95	Anco
Winter Events	Arc	C16/Plus 4	£6.95	Anco
Panik	Arc	Commodore 16	£2.99	Atlantis
Incredible Shrinking	Arc	Commodore 64	£1.99	Mastertronic
Phantom of the Asteroids	Arc	Commodore 64	£1.99	Mastertronic
War Play	Arc	Commodore 64	£7.95	Anco
Mugsy's Revenge	S	Commodore 64	£8.95	Melbourne House
Project Thesius	[illegible]	Electron	£9.95	Melbourne House
Thai Boxing	Arc	Electron	£7.95	Anco
Return to Ithaca	Ad	Spectrum	£2.50	Atlantis
The Lost Phirious Pt I	Ad	Spectrum	£2.50	Vidipix
30 Games	Arc	Spectrum	£8.95	Argus
Batman	Arc	Spectrum	£7.95	Ocean
Jock and the Time Rings	Arc	Spectrum	£1.99	Atlantis
Way of the Tiger	Arc	Spectrum	£9.95	Gremlin Graphics
Mugsy's Revenge	S	Spectrum	£8.95	Melbourne House
Screenmaster	Ut	Spectrum	£4.50	Simtron

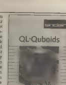
Key: Ad – adventure S – strategy-simulation
Arc – arcade Ut – Utility Ed – education

chine code knowledge you can use the sprites in your own programs. But I'm not sure that there are many people for whom this will be the right program. You can think of it as a highly powered sprite designer, but then it needs more to help you fully integrate those sprites into your own programs – there is only sketchy information about how to do this in an otherwise reasonable manual.

That £14.95 price tag puts it up against the likes of *Art Studio* from Rainbird and there is simply no contest on that level.

Program *Animator 1*
Price *£14.95*
Micro *Spectrum*
Supplier *Softcat*
PO Box 79
Macclesfield
Cheshire

BIZARRE



Much as it amazes me to say this, that most ancient and tedious of games called, amongst other things, *Panic*, in the arcades, has now turned up on the QL (where all the old arcade games past their prime go to rest). Yet *Quboids* is such a well implemented version of the game at such a reasonable price I find myself kindly disposed towards it.

Panic (or whatever the version you played was called) rejoices in one of the most bizarre plots ever to be found in an arcade game (I have a feeling that someone mistranslated Japanese instructions somewhere along the line). You wear a space suit and must keep your air replenished by collecting air bottles and eat food that is lying about; kill baddies by digging holes into which they fall and then brain them with a pneumatic hammer. Points depend on how quickly you clear the screen and how far the monsters fall.

The QL version features large smooth sprites and some amazingly good sound effects. I began playing it, sneering heavily, and in the end had to be forcibly dragged back to my desk. Drilling the little monsters heads was, I think, the element that did it – the surprise on their faces! Old to the point of senility the game idea may be, but *QL Quboids* is a fine program for all that.

Program *QL Quboids*
Price *£9.95*
Micro *QL*
Supplier *Sinclair Research*
Milton Hall
Milton
Cambridge

GOOD CHOICE

In these days of game creators, a sprite and font package seem a curiously outdated affair, yet the Anglosoft *Sprite Designer and Font Generator* has some things to recommend it.

For one thing the package is very nicely designed, using icons and windows style displays, for another it has a very large range of features including, as part of the Sprite Designer, an animated feature in which a sequence of ten frames may be constructed using any of the sprite shapes in any order.

Sprites may be single or multi colour, although the grid use to construct the shapes, pixel, obviously loses half its horizontal resolution in the latter case. Other features include expanded size sprites, mirror and flipped images.

The font generator works in a similar way to the sprite designer and also offers multi colour and mirror/flip effects. Both fonts and sprites can be easily incorporated into your own programs.

I'm still not sure that there is really much need for packages such as this any more. Simpler versions appear almost every month amongst the readers programs in the magazines and games creators do a more complete job. Nevertheless, if you want a sprite designer this is a good choice.

Program *Sprite Designer & Font Generator*
Price *£5.00*
Micro *Commodore 64*
Supplier *Anglosoft*
PO Box 60
Coventry
CV1 5SX

UTILITY

M/Drive Doctor is a comprehensive utility that gives the Spectrum the kinds of sector analysis and file repair features associated with disc drives and Talent's microdrive doctor for the QL.

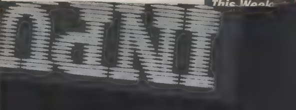
Though Spectrum microdrives seem to be pretty reliable these days, there are still a number of occasions where, for one reason or another, files get mauled and impossible to load. *M/Drive Doctor* allows you to examine files sector by sector and then dump each one to screen (whether mutilated or not) where each byte can be corrected by hand using a neat cursor system.

The other features of the program give it CP/M like disc handling features.

All the new file features are accessed via new additions to the Basic command set. Though you would probably need to be fairly technically sophisticated to get the most from the program, for those making constant use of microdrives for data storage it represents a useful utility.

Program *M/Drive Doctor*
Price *£7.50*
Micro *Spectrum*
Supplier *Piped Systems*
151 Millbridge
Dollis Valley Way
Barnet
Herts EN5 2UH

This Week



Ziggurat

Too little, too late

Anyone who has read many recent computing magazines will know that the wave of the future seems to involve IBM compatibility. We are told that Amstrad will soon market a cheap PC-compatible; Acorn is criticised for launching an MS-DOS machine that can't really be called a compatible. Other manufacturers have already launched their clones, and the price is gradually edging down towards the average home user.

All the signs seem to point towards a generation of unambitious but much cheaper PC clones, using the latest chips and ULAs to duplicate its main features for a fraction of the PC's price. And as they become cheaper, so they will be bought more by home users, either seeking compatibility with office machines, or for their intrinsic worth.

The snag is that this generation of machines will probably rely on yesterday's software designs; the best and most innovative programmers are already working on programs for the Atari ST and Commodore Amiga.

For business applications this isn't necessarily too important. The main problem here is likely to be the sheer price of programs; it doesn't seem likely that potential home users will be interested in a fairly unambitious word processing package that costs more than their computer. The first pricing cracks have appeared: some programs costing £80 to £100 offer all the features seen in equivalents costing four or five times as much. Even at this price most software would seem overpriced to most British home users, and it's likely that the introduction of cheap home machines will lead to massive price cuts.

Where PC-compatible software really lags is in the games field. Little or no innovative design seems to be undertaken; almost everything released for PC-compatibles is a conversion from 8-bit machines. A current list quotes £38 for *The Hobbit*, £19.95 for *Frogger*, and over £50 for a flight simulator. At least one of these three is much cruder than its Spectrum equivalent. The existence of games means there is an interest. And as soon as you have home users, you have games players.

The IBM's minimum specification is better than most home micros, with the sole exception of graphics capability, where the IBM design shows its age; the most common IBM standard (text in 16 colours, graphics resolution 320 × 200 in 4 colours, or 640 × 200 in one colour) will probably be used in the new machines, to maintain software compatibility, but most will probably also include much better (but non-standardised) high-resolution colour modes. Unless a new standard is agreed the current IBM modes will continue to dominate, since most programmers won't want to re-write their programs for a dozen different screen designs.

In the past British designers have shown a tendency to apply their ingenuity to every new machine; see some of the amazing programs written for 1K ZX81's, 4K Vics and 16K Spectrums for examples of how ingenuity has triumphed over the limits of hardware and common sense. It seems odd that there aren't more British programmers planning to push the limits of PC-compatibles.

Even without any innovative programming, and even before the anticipated flood of PC-compatibles appears, the huge base of 8-bit games produced in the UK could profitably be transferred to PC-compatible formats; sold at twice their normal price they'd still seem like bargains to the average PC users. Although there are obviously conversion problems, several software houses have already developed programming tools to make the transition relatively painless. Higher-level compiled languages (such as Pascal, C, and Forth) are readily convertible, provided the programmer is prepared to develop an appropriate library of routines for graphics and sound.

As an example of what might be possible, the most popular game for IBMs and compatibles is still Microsoft's *Flight Simulator*. It's held its place in the charts for at least two years. Other popular PC games include several business simulators. It seems odd to me that Acorn don't seem to have even considered converting *Elite* to the PC . . .

It seems certain that we'll have a lot of PC-compatibles in the home within the next six to 12 months. If British software houses don't start thinking about this opportunity soon, they'll be shouldered out by entrenched American interests, or find that their programs will be too little and too late.

Marcus L Rowland

Puzzle

Puzzle No 200

Can you cube 'Popular Computing Weekly'? Yes, if you use the initial letters, 'P', 'C', and 'W'.

Take these three letters and substitute a digit for each. Remember that each *different* letter must represent a different digit. The number so obtained can then be cubed.

In the following three examples (each, of course, involving a different substitution), the resulting number contains one of the original three digits in all but one of its digits.

Here are the three examples, in each case the *represents the odd digit out!

PCW x PCW x PCW = PP *PCPW
PCW x PCW x PCW = *PCCCPC
PCW x PCW x PCW = P*PWCWWW
Can you discover each value?

Solution to Puzzle 195

The multiplication was 2079* 481 = 999999

As the product consists of six identical digits, it must be a multiple of 111111. To be more specific, it must be of the form T times 111111, where T is a number from 1 to 9.

The program works by using two *For/Next* loops, one to hold the value 'T', and the other to hold the three digit multiplier. This is in the range of 123 to 987. Each of the nine possible products are worked out in sequence, and this value is divided by 'B'. A result that is a) integral, and b) in the range 1023 to 9876 is a possible solution. However, as all of the digits are different, the seven relevant digits are put into a string variable (Z$) and are tested for duplication of digits.

In the event of no digit being duplicated, the results are printed out. this reveals seven possible sets of figures, but the question stated that if you knew the value of the third digit of the four-digit number you could find the answer. Only if this was a '7' could a unique answer be found as all other values will provide more than one answer.

Winner of Puzzle No 196

The winner is P. J. Gayfer of Glasgow, who will soon be receiving the princely sum of £10.

Rules

The closing date for puzzle 200 is April 16.

This Week

Program	*Type*	*Micro*	*Price*	*Supplier*
Batman	Arc	Amstrad	£8.95	Ocean
Panzadrome	Arc	Amstrad	£8.95	Ariolasoft
Revenge of the C5	Arc	Amstrad	£2.99	Atlantis
Way of the Tiger	Arc	Amstrad	£9.95	Gremlin Graphics
Kaiser	S	Amstrad	£7.95	Ariolasoft
Melbourne Draw	Ut	Amstrad	£14.95	Melbourne House
Steve Davis Snooker	S	Amstrad	£9.95	CDS
Project Thesius	Ad	Atari	£9.95	Robico
Brom Plus	Ut	BBC	£40	Clares
Fontwise Plus	Ut	BBC	£20	Clares
Macrom	Ut	BBC	£40	Clares
Bongo	Arc	C16/Plus 4	£6.95	Anco
Winter Events	Arc	C16/Plus 4	£6.95	Anco
Panik	Arc	Commodore 16	£2.99	Atlantis
Incredible Shrinking	Arc	Commodore 64	£1.99	Mastertronic
Phantom of the Asteroids	Arc	Commodore 64	£1.99	Mastertronic
War Play	Arc	Commodore 64	£7.95	Anco
Mugsy's Revenge	S	Commodore 64	£8.95	Melbourne House
Project Thesius	Ad	Electron	£9.95	Melbourne House
Thai Boxing	Arc	Electron	£7.95	Anco
Return to Ithaca	Ad	Spectrum	£2.50	Atlantis
The Lost Phirious Pt I	Ad	Spectrum	£2.50	Vidipix
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Mugsy's Revenge	S	Spectrum	£8.95	Melbourne House
Screenmaster	Ut	Spectrum	£4.50	Simtron

Key: **Ad** – adventure
Arc – arcade
S – strategy-simulation
Ut – Utility
Ed – education

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BY PAUL SHIRLEY
DJR

Electric Dreams
SOFTWARE

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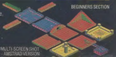
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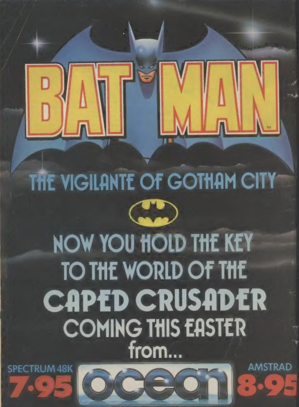
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